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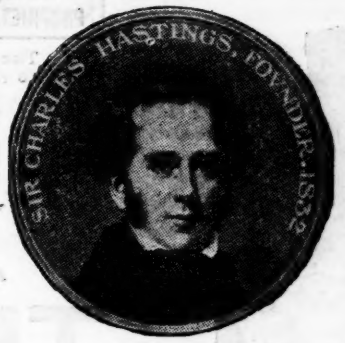

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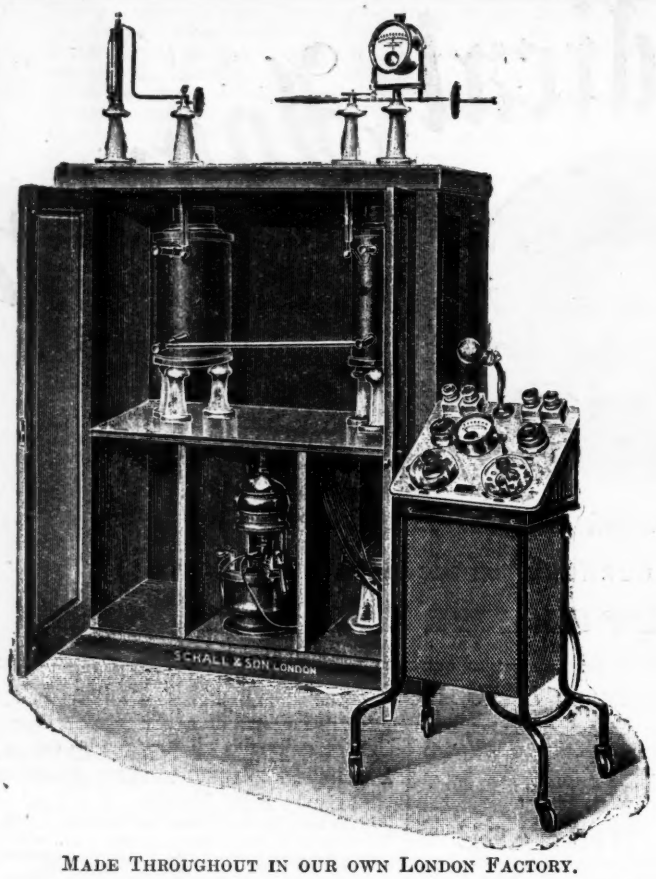

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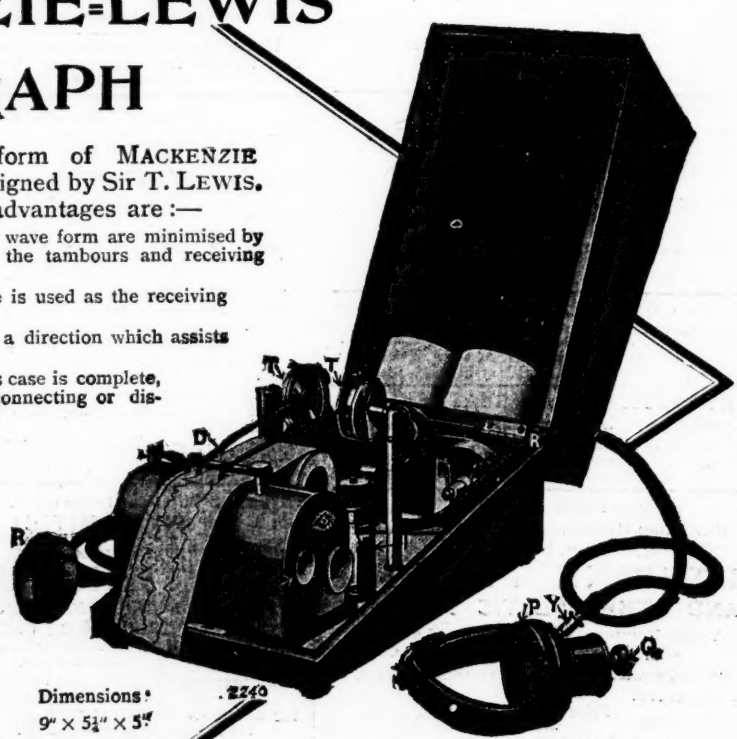

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SECTION OF OPHTHALMOLOGY.
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DISCUSSION ON THE CAUSES AND PREVENTION OF BLINDNESS.

OPENING PAPER
BY

N. BISHOP HARMAN, M.A., M.B.CANTAB., F.R.C.S.ENG.,
Ophthalmic Surgeon to the West London Hospital, the Belgrave Hospital for Children, and the National Institute for the Blind.

THE CAUSES AND PREVENTION OF BLINDNESS:
BASED ON AN ANALYSIS OF 4,288 CASES.

WE need a sound knowledge of the causes of blindness else we cannot take effective steps to prevent blindness. We need to prevent blindness because of the cruel hardships it entails upon the blind person, and because a blind person is directly or indirectly a heavy charge upon the resources of the community. To present a true picture of the causes of blindness we should need a recurring census of the blind taken by expert practitioners. Failing that, I present figures which will, I think, give such a fair impression of the causes as to allow of just deductions as to the measures for prevention. My figures come from three sources: (1) A home for blind infants; (2) the schools for the blind and partly blind of the London Education Committee; and (3) private case-books. They relate to 4,288 persons in all.

1. BLIND INFANTS.

The home for the blind infants is under the care of the National Institute for the Blind. It has only been recently opened. So far there have been presented for examination sixty-three babies. They come from all parts of the country, all are quite young, mostly babies in arms. The causes of blindness found may be grouped under: I, Surface inflammations; II, inflammations within the eyes; III, congenital defects.

GROUP I.—*Surface Inflammations of the Eyes.*

This group contains 36 cases. Of these, 31 are due to ophthalmia neonatorum, and 5 to purulent conjunctivitis of later months. Of the 5 latter cases, one lost the sight during the third week of life; the cause is not known, but from the history I should judge that there had been a streptococcal infection and a particularly destructive inflammation. Scarlet fever, diphtheria and measles accounted for one each, and one was due to an unknown cause.

GROUP II.—*Inflammations Within the Eyes.*

This group contains 7 cases. Two were due to iridocyclitis of great severity—one to cerebro-spinal meningitis, and the other probably to the same disease. Five were due to optic atrophy or defect—one followed meningitis; another probably arose from the same cause, for there is now hydrocephalus; two appear due to intracranial defect, and one to a cause unknown.

GROUP III.—*Congenital Defects.*

The cases number 19; the conditions are as follows:

Anophthalmia	2
Microphthalmia	4
Microphthalmia with congenital cataract	3
Congenital cataract	3
Albinism	1
Nystagmus	1
Buphthalmia	1
High myopia	1
Malignant disease (glioma)	2
Defect of the cornea	1

The cataracts have been operated upon, but at best vision will be very poor. The case of high myopia is of interest; in the right eye myopia is 12 D., left 5 D., there is rapid nystagmus, fixation is doubtful; the myopia was found to exist at the age of nine months.

There is one case of blindness due to accident, the child was burned, and both eyes were lost.

Table of Blindness.

Cause.	Number.	Percentage.
Purulent conjunctivitis (36):		
Ophthalmia neonatorum	31	49.2
Of later months	5	7.94
Inflammations within the eye	7	11.11
Congenital defects	19	30.14
Accident	1	1.6
Total	63	100

2. BLIND OR PARTLY SIGHTED SCHOOL CHILDREN.

For the past seventeen years I have had oversight of a number of London schools for the blind. There are six day centres for the blind accommodating 211 children and two resident schools for the older children accommodating 116. There is a large and growing provision of "myope classes" for the partially sighted in thirty-three centres, accommodating 660 children. Prior to the admission of a defective child the state of the eyes and the body of the child is ascertained and recorded. During the period of attendance at school the eyes are examined periodically, so that there is ample opportunity for the revision or confirmation of the diagnosis. The total number of blind and partially sighted children brought into this inquiry is 3,300. The conditions responsible for their state may be placed in four groups:

I. Injury or destruction of the cornea consequent on surface inflammations.
II. Inflammation within the eyeball or optic nerve.
III. Congenital defects of the eyes.
IV. Myopia.

GROUP I.—*Surface Inflammations.*

This group contains 699 children, and the causes of blindness are as follows:

	Blind.	Partially Sighted.	Total.
(*a*) Ophthalmia neonatorum	299	68	367
(*b*) Purulent conjunctivitis of later years	69	21	90
(*c*) Phlyctenular keratitis	66	176	242
			699

(*a*) Ophthalmia neonatorum is responsible for by far the greater number of cases of blindness, and in particular for cases of total blindness.

(*b*) The cases of purulent conjunctivitis occurring in later months or years of child life were due to a great variety of causes, as follows:

Causes unknown—that is, date of origin known, but actual cause not ascertainable—	30
Eczema and streptococcal infections	7
Scarlet fever	8
Measles	18
German measles	1
Meningitis	6
Diphtheria	3
Erysipelas	1
Pneumonia	2
Gonorrhoea	2
Small-pox	4
Chicken-pox	1
Whooping-cough	2
Trachoma	4

The two cases of gonorrhoeal conjunctivitis demonstrate the danger to other members of the community of babies suffering from ophthalmia neonatorum. One is a girl whose motherliness was exercised towards an affected baby; she caught the disease, the corneae ulcerated, and she is blind for life; the baby died. The other is a member of a family of three girls; the youngest, a baby,

had the disease, the whole family contracted it, besides suffering from vaginitis; the eyes of one of the children were damaged sufficiently to necessitate her being educated in a blind school.

(*c*) Amongst the cases of phlyctenular keratitis were 60 showing active nose, ear, or throat trouble, and 8 with tuberculous lesions.

GROUP II.—*Inflammation Within the Eyeball.*

This group contains a great variety of cases—inflammations of the cornea, of the iris, of the choroid, and of the optic nerve—but it is convenient to place them in two categories, according as the inflammation affected (*a*) the anterior half of the eye, or (*b*) the posterior half of the eye. The distinction is arbitrary but convenient.

(*a*) Those affecting the front half of the eye total 413 cases, of which 284 were blind and 129 partially sighted. By far the greater number are due to interstitial keratitis of congenital syphilitic origin; there are a few only of iritis or irido-cyclitis.

Interstitial keratitis—		
Due to congenital syphilis	362	
Evidence of syphilis not certain	24	
Due to tubercle, etc.	13	
Iritis or iridocyclitis—		
Due to congenital syphilis	7	
Evidence of syphilis not certain	5	
Due to cerebro-spinal fever	2	
	413	

(*b*) Of those inflammations affecting the posterior half of the eye by far the greater number were due to a form of choroiditis known as "disseminated." This condition cannot be said to be diagnostic of syphilis, for other diseases are capable of causing the same or very similar conditions, but all the evidence goes to prove that these cases in children are overwhelmingly syphilitic in origin. With the choroiditis there is always more or less atrophy of the retina, and of the optic nerve, so that vision is gravely impaired. Closely associated with these cases are many cases of total optic atrophy.

This group includes 349 cases, of which 294 were blind and 55 partially sighted. Of these, 210 were definitely the subjects of congenital syphilis.

1. Disseminated choroiditis with or without optic atrophy:		
Of syphilitic origin	210	
Syphilis not certain	19	
2. Disseminated choroiditis or optic atrophy of which the cause was assigned to other effects than syphilis, or of which the cause was indeterminate:		
Optic atrophy without choroiditis, cause unknown	39	
Ditto, post-febrile (scarlet fever 1, measles 1, diphtheria 1, influenza 1, unknown 12)	16	
Ditto, following head injuries	4	
Ditto, following meningitis	20	
Ditto, following cerebro-spinal meningitis	6	
Ditto, with grave mental defect	13	
Optic atrophy, familial	7	
Choroiditis, familial	4	

(*c*) There is a small group of 157 cases which falls more or less into this main second group.

Injuries		43
Blind from sympathetic ophthalmitis	29	
Partially sighted—one eye lost, other defective	14	
Buphthalmia or congenital glaucoma		17
Blind	14	
Partially sighted	3	
Honeycombed teeth	5	
Hutchinsonian teeth	2	
Macular defects		37
Blind	32	
Partially sighted	5	
Congenital colobomata	11	
Deficiency	13	
Day blind	12	
Some evidence of syphilis	5	
Congenital nystagmus (not including those with myopia)		58
Blind	17	
Partially sighted	41	
Double detachment of retina, cause unknown		2
Retinitis pigmentosa		39
Blind	34	
Partially sighted	5	
Sporadic cases	23	
Familial cases	14	
Sole child cases	2	
Evidence of syphilis	3	
Deaf mute	1	

GROUP III.—*Congenital Defects.*

This group contains 408 cases of great variety and interest. For the most part it is not possible to discover to what primary causes these congenital defects are due. Some few are hereditary—that is to say, the same defect is found repeated in the same family for two or more generations. This is particularly true of certain forms of cataract. Numerous pedigrees of this order have been published. The majority of these defects are, however, sporadic; they may appear in families whose other members are quite normal. In some instances there is a definite history of illness on the part of the parents, particularly of the mother before or during pregnancy; in some there is evidence of a syphilitic infection. Some few parents who are abnormal from one form of physical defect have produced children who suffer from another form of physical defect—for example, a father and mother both deaf and dumb but with good eyes have a family of five, of whom two are partially sighted by reason of congenital dislocation of the lenses.

(*a*) Albinism (blind 36; partially sighted 33)			69
Familial cases (syphilis 1)	22		
Sporadic cases (syphilis 2)	47		
(*b*) Defects of the crystalline lenses (blind 170; partially sighted 78)			248
Microphthalmia and cataract (syphilis 2)	18		
Ditto, hereditary	9		
Microcephaly and cataract (syphilis 2)	10		
Posterior-polar cataract (syphilis 4)	22		
Congenital cataract, varied types (syphilis 13)	101		
Lamellar cataract, post-natal (syphilis 3)	57		
Dislocated lenses, congenital (syphilis 1)	31		
(*c*) Varied defects of the globes and the accessory organs of vision (blind 66; partially sighted 25)			91
Aniridia	10		
Coloboma of iris and/or choroid	27		
Microphthalmia	25		
Congenital anophthalmia	3		
Glioma retinae	3		
Defective muscles	2		
Defective muscles and face	3		
Extreme hypermetropia	4		
Oxycephaly	11		
Conical cornea	2		
Hereditary corneal opacities	1		

(No evidence of syphilis in this subgroup.)

GROUP IV.—*Myopia.*

The degree of myopia cited is the mean of the four meridians of the two eyes—for example, −10 D. sphere with −3 D. cylinder in one eye, with −8 D. sphere and −6 D. cylinder in the other, give a mean of 11 D.; this is the only convenient way of summarizing such cases, although the method has the disadvantage of not showing the additional defect of vision caused by a high degree of astigmatism.

Cases of High Myopia.

Complicated cases producing blindness more or less severe	34
Myopia with nystagmus, vision very bad	20
Myopia 5 to 10 dioptres	509
Myopia 10 to 15 dioptres	592
Myopia 15 dioptres and over	80
Total	1,235

No evidence of syphilis in the group; there are a number of cases of myopia with interstitial keratitis and disseminated choroiditis of syphilitic origin; these are counted with the latter diseases.

Summary of School Cases.

The provision of myope classes, and the knowledge of their provision by the extended school medical service and by the hospital surgeons, has led to the report of many cases of defect which in earlier years would never have come under review. The new conditions prevent the comparison of this return with my previous statistics[1] in the gross, some adjustment is needed to bring them into reasonable relation. I propose, therefore, to adjust these latest returns so as to put them into as nearly the same position as those of former years, and in doing this to take into particular account the future prospects of the children.

In the table that follows, the words in brackets (all) or (bad) which succeed the name of the condition or disease producing blindness indicate whether the total number of

those so affected are included in the count or only the worst cases, such as myopes who could not be dealt with in a myope class because of the gravity of their defect.

Tabular Statement of Causes of School Blindness, with Comparison between 1913 and 1920.

Disease.	Number.	Percentage 1920.	Percentage 1913.	Gonorrhoea.	Syphilis.	Syphilis not Certain.
Ophthalmia neonatorum (all)	367	19.79	*24.17*	367	—	—
Purulent conjunctivitis of later years (all)	90	4.85	*4.27*	2	—	—
Phlyctenular keratitis (bad)	66	3.56	*3.45*	—	—	—
Interstitial keratitis (all) ...	399	21.51	*19.18*	—	359	24
Iridocyclitis (all)	14	0.76	*0.54*	—	7	5
Optic atrophy with or without disseminated choroiditis (all)	349	18.81	*20.18*	—	212	19
Buphthalmia (all)	17	0.92	*1.54*	—	5	2
Sympathetic (all)	29	1.56	*1.45*	—	—	—
Macular defects (all) with congenital nystagmus (bad)	55	2.91	*2.09*	—	5	—
Retinitis pigmentosa (all) ...	39	2.10	*1.81*	—	3	—
Detached retina of both eyes, cause unknown	2	0.10	—	—	—	—
Albinism (bad)	36	1.94	*2.27*	—	2	—
Lens defects (all)	248	13.37	*12.90*	—	25	—
Other congenital defects (all)	91	4.90	*4.81*	—	—	—
Myopia (bad)	54	2.91	*1.18*	—	—	—
Totals	1,855	100.00		369	618	50
Percentages				19.89	33.31	2.69

1913 and 1920.—The difference between the returns of these two periods is clear when the percentages of the four main classes are set out.

Disease.	1913.	1920.	Rise.	Fall.
Congenital defects	25.06	27.13	2.07	—
Ophthalmia neonatorum ...	24.17	19.79	—	4.38
Syphilitic inflammation ...	29.70	31.43	1.73	—
Miscellaneous	20.47	21.65	1.18	—

It would appear that the fall in the percentage of cases of ophthalmia neonatorum is a real fall, and that the apparent small increases of the three other groups are merely proportionate increases due to the fall in the second factor.

3. Blindness in 925 Persons of All Ages as Ascertained in Private Practice.

The desirability of securing data of blind persons of all ages led me to investigate a series of my own private cases. Some 5,000 were examined seriatim. The patients were of all classes—well-to-do, middle class, and some artisan, with an inclusion of a certain number of persons, mainly of the working classes, referred for examination and report by the National Institute for the Blind. This inclusion perhaps swells the number of the blind beyond the usual for private practice. The patients were of all ages, and, as may be expected, adults were in the majority; 925, or about one-fifth of all these patients, were blind or partly blind in one or both eyes; 603, or about one-eighth, were blind or partly blind in both eyes.

In the following table the degree of defect of the sight is noted in five columns, as follows: 1, One eye defective. 2, One eye blind. 3, Both eyes defective. 4, One blind, one defective. 5, Both blind. In taking the totals and percentage only those in the last three categories are included. Categories 1 and 2 are given for purposes of comparison, but are not included in the count.

Disease.	1.	2.	3.	4.	5.	Total Cases.	Per Cent.
Congenital defects						34	5.64
Dermoid of cornea	—	1	—	—	—		
Coloboma of uvea	—	—	—	1	—		
Albinism	—	—	—	—	1		
Nystagmus, macular defects	—	—	3	2	2		
Microphthalmia	—	—	—	—	2		
Dislocated lenses	—	—	1	1	3		
Lenticonus	—	—	1	—	—		
Cataract, various	1	4	4	4	6		
Cataract, lamellar	—	—	4	1	—		
Accidents						20	3.32
Casual in civil life (birth 7)...	5	39	—	4	6		
War...	—	6	—	—	1		
Industrial...	3	15	2	4	3		
Purulent conjunctivitis						34	5.64
Ophthalmia neonatorum ...	—	3	1	3	10		
Later years (gonorrhoeal) ...	—	6	2	—	9		
Trachoma	—	—	8	—	—		
Essential shrinking	—	—	—	—	1		
Corneal diseases						51	8.46
Conical cornea	4	—	6	1	2		
Superficial keratitis	2	6	6	2	1		
Hypopyon keratitis	—	2	—	2	—		
Interstitial, syphilitic ...	—	4	3	11	10		
Interstitial, tubercle	1	—	—	2	1		
Interstitial, leprosy	—	—	—	1	—		
Sclerosing keratitis	—	1	—	—	3		
Cataract, senile	4	6	44	28	17		
Cataract, diabetic	—	—	1	1	3	94	15.09
Iritis and iridocyclitis						56	9.29
Syphilitic	1	5	1	3	11		
Various (with tubercle 6, gonorrhoea 5, cerebrospinal 2)	2	22	11	17	13		
Vascular diseases						49	8.12
Vitreous haemorrhages ...	—	1	—	—	1		
Embolism, thrombosis ...	—	6	—	1	1		
Retinitis, renal	2	4	3	5	11		
Retinitis, diabetic	—	—	3	3	7		
Retinitis pigmentosa ...	—	—	5	2	—		
Detached retina (10 with myopia less than 10 D.)	—	11	—	6	8	14	2.32
Choroiditis						77	12.77
At macula	1	13	3	3	6		
Central senile	2	4	17	9	13		
Disseminated, syphilitic ...	2	2	1	2	12		
Disseminated, other causes	—	1	2	1	8		
Optic atrophy						38	6.3
Various causes (syphilis 6)	—	7	5	2	11		
Leber's	—	—	—	—	2		
Tabes	—	—	1	2	8		
Pituitary disease	—	3	2	—	—		
Hemianopia	—	—	4	—	1		
Glaucoma						55	9.12
Buphthalmia	—	—	—	4	2		
Chronic glaucoma	3	3	13	12	12		
Acute glaucoma	1	5	2	4	6		
Malignant	—	2	—	—	2	2	0.35
Myopia over 10 D. (detachment of retina in 11 cases)	6	1	35	30	19	84	13.93
Squint, one eye amblyopic ...	—	55	—	—	—		
Tobacco amblyopia (not counted in total)			7				
Total						603	100.00

Some notes may be added on the several categories of disease or injury causing blindness.

Accidents.—It is noteworthy that casual accidents, occurring in civilians in their ordinary life and unconnected with their occupation, accounted for just twice as many cases of damaged sight as did industrial accidents (casual 54, industrial 27). For the most part the casual accidents destroyed one eye only, the other remaining healthy, so that most of the patients were able to carry on with their usual occupation. The severe cases followed by blindness numbered 10, nearly the same as the industrial, 9. There were 3 cases of sympathetic ophthalmitis after casual accidents and the same number after industrial. War cases were few in number, probably owing to the special arrangements made for blinded soldiers. Injuries at birth head the list of individual cases of casual blindness and number 7. In children missiles, whether thrown by hand or discharged from some form of toy gun or catapult, were the most prolific cause of loss. In later years amateur wood-chopping accounted for more cases than any other single cause. The variety of other causes responsible for loss was very wide. There were two cases of lost eyes from injury by broken spectacles;

one boy ran into a gatepost in a fog, and one woman stooped in a dark room and struck against a chair-back; in each case a spectacle lens was broken and driven into the eye. Considering the large number of persons of all ages who habitually wear glasses, these accidents are remarkably few, and they are probably more than counterbalanced by the cases where spectacles have saved eyes from direct injury. The causes of industrial accidents were also very varied:

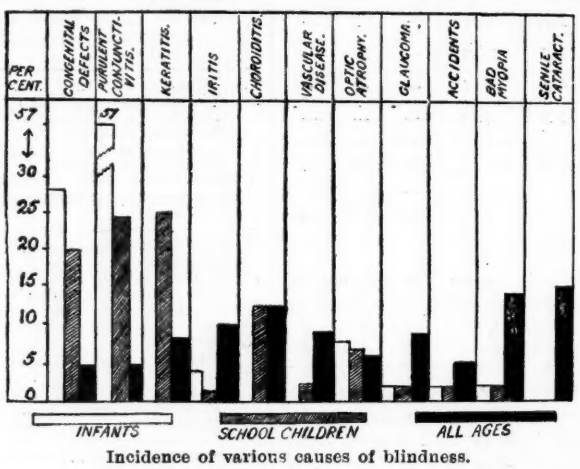
Decarbonizing motor cylinder, 1; waiter injured by soda-water bottle cap, 1; engine gauge burst, 1; blow lamp burst, 1; driving belt break, 1; stonemasons, 2; caustic splashes, 2; acid splashes in process block making, 3; laboratory worker acid splash, 1; borax scale in brazing, 1; rivet, 1; tin strip, 1; grindstone burst, 1; steel splinters in lathe workers, 4; explosion in cartridge factory, 1; coal miner, 1; thorns in gardening, 3; septic tooth (dentist extracting tooth), 1.

Of these 27 cases at least 10 belong to the preventable order—that is, the stonemasons, process workers, steel workers, and cartridge maker; the last named accident was caused by a direct breach of the factory rules.

Conjunctivitis.—Only one case of direct infection of the eyes by gonorrhoeal discharge in an adult was found; the rarity of this severe affection compared with the frequency of urethral gonorrhoea is remarkable. The trachoma cases were mostly old cases where the disease was arrested but the sight badly damaged.

Corneal Diseases.—Of all forms of diseases of the cornea responsible for blindness, interstitial keratitis, with or without iritis, and due to congenital syphilis, heads the list, accounting for 28 cases in 72.

Senile Cataract. — Senile cataract accounted for more blindness in this collection than any other disease. No doubt many of the cases would be susceptible of amelioration if and when operation could be performed, but at the time they were industrially blind. The seventeen blind in both eyes include several who had been operated upon successfully by myself or other surgeons, but who were found after operation to suffer from central senile choroiditis; operation secured for them some freedom of movement, but owing to degeneration of the retina they could not see definite objects or read. These cases are very disappointing to the surgeon and to the patient, and perhaps do more to discredit operation in the popular mind than the less frequent cases of operative failure or post-operative inflammation. Unfortunately the condition cannot be foreseen.



Incidence of various causes of blindness.

Iritis and Iridocyclitis.—Of known causes of iritis syphilis heads the list. Syphilitic iritis produced total blindness nearly as frequently as all the other causes together. Cases classed "various" include a great variety of approximate causes, such as those arising from septic states within the body, tubercle, gonorrhoea, rheumatism, gout, pyorrhoea, colon disease, and bladder infection in nearly equal proportions. There were several in which no cause could be assigned with any certainty.

Vascular Diseases.—Blindness due to vascular diseases, such as kidney disease and diabetes, was not frequent when the incidence of these general diseases is considered.

One of the cases in this group illustrates the danger of the "one-eyed" man. A man with one eye practically blind from old squint lost the other completely by embolism of the central retinal artery. (Two other cases of one eyed men in the return lost the remaining eye, one by accident, the other by disease.)

Detachment of the Retina.—In this group are 25 cases, of which 14 were blind.

The causes of the detachment were many. Ten occurred in subjects of myopia of less than 10 D.; other cases were due to the effects of antecedent inflammation of the eye causing vitreous changes; some to alleged but unproven injury; several to attacks of inflammation secondary to vascular or septic disease; and in some no cause could be found. Besides these there were 11 other cases of detachment in the myope group and one double detachment due to accident. So that there were in all 37 cases of detachment.

Choroiditis.—The frequency of senile decay of the retina and choroid at the macula was remarkable. There were 45 of these cases in a total of 109. The condition is irremediable, and probably unpreventable, but the subjects of it are not so hapless as those blind from other causes, for they can move about by sight with comparative freedom, even though the sight of definite objects and of reading is lost to them. I had one patient, a parson, who did his full duty; his parishioners did not know of his blindness, a good memory enabled him to "read" lessons and prayers, whilst his keen observation enabled him to recognize his parishioners by gait or tricks of manner.

Optic Atrophy. — Syphilis headed the list of primary causes of optic atrophy, being responsible for nearly one half of the cases, including 6 cases of simple atrophy and 11 of tabes dorsalis.

Glaucoma.—It is noteworthy how much more common was the chronic form of glaucoma than the acute, and how much more dangerous were its effects. Even after successful operation gradual decline of vision was common.

Malignant Disease.—Malignant disease was a rare cause of blindness. Of the two totally blind, one was a child with double glioma of the retina, the other a man with sarcoma in one eye; his other eye had been lost earlier by embolism of the retinal artery.

Myopia.—In this group only those with myopia of 10 dioptres or more were included. They numbered 99. Of these, 8 had good vision, 6 defect of one eye, and one blind of one eye; 84 had more or less bad vision, and were blind for industrial purposes. High myopia, therefore, comes second on the list, as a cause of blindness, after senile cataract, and unlike the latter its effects are irremediable. The causes of the failure of vision were mainly three: vitreous degeneration and opacities, detachment of the retina, and choroidal degeneration. Of the three, the last was the most frequent. The changes seen were patches of gross degeneration, or much more frequently finer degenerative changes more nearly like a coarse form of central senile choroiditis. Not infrequently the final loss of central vision was due to a haemorrhage into the threadbare tissue of the macula. These figures of the high incidence of blindness amongst high myopes form a strong plea for the increase of preventive educational methods, such as the myope class amongst children, so that they may learn to use their eyes with discretion; and also for care in the selection of suitable work for them when they leave school; too many of these persons with high degrees of myopia and blindness had been occupied in clerking.

Squint.—The risk of the "one-eyed" has been commented upon. The loss of central vision from squint can be prevented in many cases if they are treated early. There is still a belief abroad that children "grow out of squint," but they do so with the loss of an eye. They become ineligible for the services, for many forms of industrial employment, and there is an added risk from accident.

Tobacco Amblyopia.—The number of cases of chronic poisoning and loss of vision from the excessive use of tobacco was small. The disease is remediable; those seen were referred by other doctors, and since they were not seen a second time it is assumed that they were cured by treatment.

The Incidence of Venereal Disease.—Cases of ophthalmia neonatorum numbered 17; assuming these severe cases to have been gonorrhoeal, they make with the one case of gonorrhoeal conjunctivitis in an adult 18, or 1.95 per cent. of the gross total of 925; including the 5 cases of gonorrhoeal iritis the total percentage equals 2.48.

Cases of disease due to syphilis—keratitis, iridocyclitis, choroiditis, optic atrophy, and tabes—numbered 85, or 9.19 per cent. of the gross total. These syphilitic cases form the largest group of preventable disease in this all-age selection of blind persons.

4. Causes and Prevention.

1. The difference in the incidence of the various causes of blindness in these three sets of cases under examination is clearly shown in the accompanying chart.

(*a*) In infancy the causes of blindness are few, so the

percentage of these causes is high. Congenital defects and purulent conjunctivitis account for nearly all, other causes are few and the number of cases insignificant.

(*b*) Amongst school children other conditions come into account. First, the death rate of infancy will have reduced the number of cases of blindness in infants. Secondly, other causes of blindness will show their effects, particularly those arising from constitutional disorders. So that the startlingly high percentage due to ophthalmia neonatorum is reduced, and takes second place to the larger number of blind cases due to congenital syphilis.

(*c*) In the third group of persons of all ages, infants, children and adults, there are again two facts that modify the conditions found for infants alone, or children alone. The age proportion of the population comes into full play, the greater number of adults reduces the infant population to its correct position, and correspondingly the incidence of the several causes of blindness. But other causes of blindness which affect mainly or only adults—accidents, vascular disease, glaucoma, gross myopia, and senile cataract—swell the total blindness and correspondingly diminish the proportion of blindness of infancy or childhood.

I suggest that the return of the third set of evidence presented, from all ages, gives a fair picture of the causes of blindness occurring in the population of this country generally. Minor differences may appear in different areas due to special industrial conditions, but these will hardly be likely to affect the main proportions.

2. Examination of popular literature indicates that wholly erroneous beliefs are held as to the causes of blindness owing to the laxity with which statistics are quoted. Looking at my returns one would be justified in stating that 50 per cent. of the blindness of *infancy* is due to the preventable disease ophthalmia neonatorum, but wholly wrong in stating that 50 per cent. of blindness was due to this cause. Again, it would be correct to state that 50 per cent. of the blindness in *school children* is due to parental venereal disease, but not that 50 per cent. of blindness is due to venereal disease; yet I have seen this statement in print, based on an incorrect quotation of my 1913 returns. The true figures for "all ages" are seen to be blindness from gonorrhoeal disease 2.5 per cent., from syphilis, 9 per cent.

3. Prevention. If we examine the tale of the causes of blindness we shall see that there are certain causes over which we can have little influence, and others which are well within our power of prevention, possibly of extinction.

(*a*) *Congenital Defects.*—Too little is known of the primary causes of sporadic cases to permit of useful suggestion. A small number are hereditary; where the defect is serious marriage and parenthood is undesirable.

(*b*) *Ophthalmia Neonatorum.*—Prevention of the disease can be secured by the treatment of the vaginal disease of the expectant mother; this is the one and only certain means of prevention. And it is within our power to accomplish this desirable end. Measures to check the effect of the infection in infants have reached a high measure of success. Prophylaxis and notification have done much to this end. Short of a stiffening up of the procedure in certain districts of the country these measures have accomplished all that they can. What is now needed is the establishment of such medical arrangements that diagnosis and treatment can be made as swiftly as the fire brigade can be brought in when there is an outbreak of fire in our homes. I would like to see established in the centre of every convenient area an ophthalmia neonatorum unit. There should be a small hospital to which affected mothers and infants could be transferred for treatment. To this there should be attached a mobile diagnostic unit—a motor car fitted with a small laboratory equipment with an expert ophthalmic surgeon and nurse; the unit should be available for immediate attendance at any home where a suspected case occurs. Midwife or doctor in attendance should notify the initial symptoms of any case, so that the mobile unit could proceed to its investigation without delay. If the surgeon should find the diagnosis proven it should be possible to remove the mother and infant to the hospital for treatment forthwith. The benefits of prompt removal of affected cases has been demonstrated in Liverpool. A similar hospital has been established in London, but its benefits have been almost nullified owing to the lateness of the transfer of cases. I believe doctors would welcome the possibilities of prompt assistance in diagnosis, for cases are not numerous, and accurate diagnosis is only possible where there is constant handling of these cases. The costs would be little compared with the benefits in the reduction of blindness.

(*c*) *Purulent Conjunctivitis in Later Years.*—The number of cases is so small and the variety of primary causes so large that it would appear that we have here something like an irreducible minimum. It is remarkable that trachoma is almost negligible as a cause of blindness in this country.

(*d*) *Phlyctenular Keratitis.*—The number of bad cases arising therefrom is small, but the number of damaged eyes is large. These cases are most certainly preventable. They are primary, due to social conditions—poverty, poor food, dirt. They are scarcely known amongst well-cared-for children. Treatment of relapsing cases cannot be effectively carried out unless there is a long period of efficient treatment in a high and dry country district. Recently arrangements have been made in London for the removal of cases occurring in school children to the Swanley Ophthalmia Schools in Kent, and we may expect good results from these measures.

(*e*) *Syphilis* is one of the great causes of blindness. It is certainly preventable. It rests with the success of the centres for the treatment of venereal diseases. If parents were effectively treated before procreation, cases of blind children from this cause would be extinct. There is no reason why we should not attain this success.

(*f*) *Industrial Accidents.*—Blindness from this cause is likely to show variation in different parts of the country. It will be high in industrial areas. Prevention is to be obtained by the better safeguarding of machinery and the use of goggles in all work where flying fragments are common. There is at present a prejudice amongst workers against goggles. A large part of this is, I believe, due to the atrociously bad fit of the common run of these protectors. Difficulties from sweat and steam there will be always, but if to these there be added a fit so uncomfortable that the face is hurt and vision obscured it is no wonder that goggles are objected to. Well-fitting goggles suited to the particular industry, and the extension of the propaganda of the "Safety First" Association, will go far to popularize their use and reduce accidents. Introduction of a bonus scheme into workshops whereby workers gained by the reduction of accidents would go far to stimulate healthy views on the desirability of workers protecting themselves. In some work, such as in coal mines, where accidents are common and sepsis therefrom dangerous, protectors are impossible of use; in such cases first-aid stations, where foreign bodies can be promptly removed and risks of infection averted by irrigation, are needed urgently.

(*g*) *Myopia.*—This is no place to discuss rival theories of the causes of myopia. Purely by way of convenience we are accustomed to speak of two divisions—a "school" or "acquired" myopia, and a "congenital" or "pernicious" myopia. School myopia is of low degree and does not figure in this return. This low degree myopia is probably due to many causes acting singly, consecutively, or conjointly in this or that case. A hereditary softness of the coat of the eye, softness of the body due to illness, difficulty in seeing owing to astigmatism, habitual close work under bad conditions of light, position, and health, are each and all undoubtedly causes severally or jointly in the production of myopia of low degree. Of all of these the last, the conditions of work (duration of close work, lighting at work, position at work, and the state of health whilst at work, for child and adult) is the one factor that is in our power to influence. For that reason it is wise to concentrate on the possible. But the cases of myopia in the return of this paper are not these. The children of the myope classes are high myopes, and some are found at such an early age that environment cannot be responsible for their onset. The figures show that the maximum incidence ranges between 10 and 15 dioptres of myopia—a very high figure. It is obvious to the least observant that even when provided with suitable glasses these children see with difficulty both distant and near objects. Further, there is evidence that these stretched eyeballs are frail, and that there is an ever-present risk of damage or degeneration of the retina, and that this risk is increased by strain. The myope classes are established to meet these two difficulties; to provide these handicapped children with a scheme of education which can be undertaken with least strain to the eyes, and to teach them such methods of work as may, by becoming habitual, even after school years, help to prevent the dangers that threaten. This influence is made conspicuous when the child leaves school by assisting arrangements for obtaining suitable work, a matter of especial moment when we note

how high a proportion of adults with high myopia and retinal degeneration have been employed as clerks. The scheme of the myope class is very simple. It is a reversion to the times when the teacher was supreme in the class and not books and paper.[2] There are thirty-three of these classes in London; classes have been established in Bolton, Birmingham, Bradford, Leicester, Leeds, Liverpool, Stoke-on-Trent, Nottingham, Exeter, Brighton, Bristol, Sheffield, Walthamstow, in some towns of Scotland, in several of the United States of America, and a special committee has reported in favour of establishing them in Canada. There is room for the establishment of more of these classes particularly in urban areas; it would be a genuine measure for the prevention of blindness.

References.
[1] British Medical Journal, August 29th, 1914. [2] The curriculum of the myope class was detailed by the writer in a paper, "Sight-saving Schools," *School Hygiene*, February, 1919.

DISCUSSION.

Dr. J. Alexander Wilson, O.B.E. (Glasgow) said: The paper read by Mr. Bishop Harman represents much hard work, and embodies a large amount of information. Mr. Harman's sources of information, however, are not adequate for a correct estimate of the prevalence of blindness. We require full knowledge of its prevalence at all ages. His second and largest division is composed of 3,300 school children, and among these there are 1,235 cases of myopia, with from 5 dioptres upwards. This is an extraordinary importation into a paper on blindness. If moderate and fairly high degrees of myopia fail to respond to the appropriate correction, then we suspect the presence of some condition other than myopia. A small percentage of myopia is due to keratitis and the remainder to heredity. In my opinion school work does not produce myopia. Hypermetropia is much more prevalent among scholars, and these should be considered together.

Before the passing of the Blind Persons Act, 1920, the Local Government Board for Scotland endeavoured, in 1918, to compile registers of blind persons in Scotland. The definition of blindness adopted by the Local Government Board was "Too blind to perform work for which eyesight is essential"; but their form of inquiry distinguished between the following classes: (*a*) total blindness, (*b*) can distinguish light, (*c*) prevents performance of work for which eyesight is usually considered necessary. An advisory committee reported that there are in Scotland 4,528 blind persons, and that of these the larger half are over 50 years of age. The number of blind children is only 377.

We need some unification of standards before we proceed to classification. The table of blindness published many years ago by Fuchs in his Prize Essay contains interesting groupings, somewhat out of date, perhaps, but still full of interest. Venereal disease was then and still is the chief cause of blindness.

Mr. E. H. E. Stack (Bristol) said: Mr. Bishop Harman has put together a most useful paper which gives an excellent basis for discussion. The sad note in it is the high percentage of defective vision and blindness due to venereal disease. I would like to ask him whether when he is publishing his paper he could emphasize this by a table which could be quoted in publicity work and would be a guide to general practitioners—I mean a statement giving an estimate of the percentage of venereal disease cases in schools and private practice. As I gather it from his figures he could say that, apart from refractions, 1 in 3 of all school cases of defective vision is venereal, and 1 in 12 of private cases.

May I say a word about amblyopia ex anopsia? Mr. Bishop Harman says many of these cases could be prevented if they were treated early. To have this done all children should have a routine examination at 4 years to see that both eyes are working together, even when there is no squint. The family doctor and the public should be taught this necessity, as it is but little use later on. With regard to myopia, the schools to which I have had the pleasure of going with the opener of this discussion are doing good work, but in boys and girls in private schools I never stop their education but insist on two points: (1) That they only use their eyes for what has to be done for school and not extra reading of story books; (2) the parents are advised to look out for a hobby and develop it early, such as gardening or poultry. Dr. Symes recently in Bristol drew attention to the high percentage of cases of phlyctennular ophthalmia in erythema nodosum. As this is rare it is not of great importance, but it may help in the etiology of this difficult subject.

Finally, I find the cases which give most anxiety, and which perhaps stimulate our sympathies more than any other disease, are those of recurrent iridocyclitis. In spite of all our care some of these cases simply go from bad to worse; some do well with tuberculin, but we do not yet know which are going to be those which it will benefit.

Mr. A. S. Percival (Newcastle-on-Tyne) pointed out that the steaming of glasses could be entirely prevented by rubbing the spectacles or goggles with dry soap, then wiping it off and polishing the glasses. It would be found that breathing on lenses so treated fails to dim them. Laundry women could do their work in hot steaming washhouses without any trouble arising from their glasses getting dimmed if they adopted this simple precaution. Mr. Harman had said that there seemed to be no method of discovering a central choroiditis or a macular haemorrhage if a patient first came for advice with advanced cataract. He himself advocated the use of his light sense discs in such cases. He had found, even in advanced cataract cases, that if the light difference sense were found to be considerably greater than the light minimum sense one could be confident that something was at fault with the retina or choroid. If the light difference sense were the more defective something was wrong with the conducting mechanism—the optic nerve.

Dr. Harold Scurfield (M.O.H. Sheffield) asked if Mr. Harman thought the routine treatment of the eyes of every infant at birth with an appropriate silver salt would prevent ophthalmia neonatorum, and if he thought early treatment by an ophthalmic surgeon would, practically speaking, abolish loss of sight in such cases as did occur? He agreed that early skilled treatment at present was not obtained often enough. The midwife washed the baby and saw the condition of the eyes, and was bound to let the M.O.H. know of "any inflammation of, or discharge from, the eyes, however slight." The M.O.H. could then arrange for an ophthalmic surgeon to attend. If the birth was attended by a doctor the baby was washed probably by an untrained woman, and the beginning of the trouble might not be noticed so soon. The occurrence of a case of ophthalmia neonatorum in a doctor's practice was a comparatively rare event, and he did not always see the "red light" at once. He agreed with Mr. Harman that they needed to treat these cases with "fire-brigade" promptitude. His own belief was that early treatment of every case of ophthalmia neonatorum by an ophthalmic surgeon would save seven-eighths at least of the eyes at present lost or damaged.

Dr. George Foggin (Newcastle-on-Tyne) said that he had had the oversight of a school for the blind for some fifteen years, and during that period he had made an annual return of the causes and conditions of blindness. His experience suggested that it would be very desirable that there should be a standard scheme for the classification of the conditions found, so that comparisons between different areas might be facilitated. He strongly supported the formation of more "myope classes," as these classes provided a most useful means of educating children who were not blind enough for the blind school and too poorly sighted for the ordinary school. He knew of children who were being educated in blind schools who ought not to be there, but in the absence of a myope class there was no other provision for them.

Mr. Inglis Pollock (Glasgow) said that he had seen a number of patients blind with glaucoma who thought that the blindness was due to cataract, and expected that an operation would give them back their sight. They always said that someone had told them that it was cataract. Other cases came blinded by glaucoma which had been treated by their doctors as iritis and given atropine until the eyesight had been completely and finally lost. It was impossible for any one who had not specially studied eye diseases to diagnose glaucoma in the early stages, and therefore no practitioner should make a diagnosis of

cataract, or even iritis, in a patient over 40 years of age until it had been confirmed by a specialist. It might be said that the diagnosis of cataract was easy in the advanced stage, but there might be present diseases of the fundus which could only be discovered before the pupil had been completely closed by the cataract. The effect of mistakes in diagnosis of glaucoma was so disastrous, and operation could only do good in the early stages, that it was important that every patient of over 40 years of age should be sent to an eye surgeon for diagnosis, either in hospital or elsewhere.

Mr. J. V. PATERSON (Edinburgh) spoke of the difference between private and hospital work with regard to the frequency of such conditions as interstitial keratitis, ophthalmia neonatorum, phlyctenular keratitis, and hypopyon ulcer. He found that these conditions were extremely rare in private practice, where the social and economic condition of the patient was on a higher level than that of the class which sought hospital advice. It did not seem, therefore, too much to hope that in a few decades the number of cases of blindness or semi-blindness from these diseases would be very greatly diminished. He thought that the people of this country did not realize sufficiently that the loss of sight in early youth was not merely a life tragedy for the individual but also a great economic loss to the community. He agreed thoroughly with Mr. Bishop Harman in his appeal for the utmost promptitude in dealing with cases of ophthalmia neonatorum. With regard to the education of myopes, Mr. Paterson said that in his private work he had never found it necessary to remove a child from school for any considerable length of time, and he did not think high myopes should constantly have before them the idea that they were going blind. He thought the health of the children and the wearing of correcting glasses all-important. He did not believe that excessive near work was the essential factor in the production of high myopia.

Dr. MARION GILCHRIST (Glasgow) thanked Mr. Bishop Harman for his extremely interesting paper. In regard to the causes of blindness, Mr. Harman mentioned trachoma, and said this was rare in London. It was, however, not so in Glasgow, and she had seen a great many cases there almost blind from trachoma, probably because of the number of Polish Jews who are there. The question of myopia was a very serious one. She was disappointed that Mr. Harman did not put more emphasis on the great value of extremely careful refraction work. Far more importance should be attached to this than to any other factor such as the provision of special schools for myopes. She had often been forced to question the value of special schools. Many children were brought to her at the dispensary who were attending a special school for myopes, and were kept with their pupils dilated by atropine, their refraction not corrected, suffering from headaches—especially the astigmatic ones. After careful correction of refraction errors these children had been able to go to the ordinary schools, and their mothers had told her that they were going on very well, with no headaches, and that their education was progressing well. With regard to the treatment of ophthalmia neonatorum, we fail most in not teaching the parents or nurse how to carry out the treatment. Dr. Reid of Glasgow used to teach that the one thing needful was to use plain water or normal saline or boric solution, but to use it often enough and thoroughly enough both day and night. Often harm was done by using strong solutions, and by rough handling of the eye.

Mr. HERBERT CAIGER (Sheffield) said that venereal disease was responsible for much blindness, especially that due to ophthalmia neonatorum. Poverty was responsible, to some extent, for phlyctenular cases. Alcohol was a most prolific source of venereal disease and poverty. It would be interesting to see when sufficient time had elapsed the effect of prohibition on the statistics of these cases in the United States of America.

Mr. BISHOP HARMAN, in reply, said that the criticism advanced by Dr. Alexander Wilson on the inclusion of numerous cases of high myopia with the blind did not arise, for examination of the tables of statistics would show that no case of myopia was included in the final count and in the percentages, unless the myopia was of such a nature that sight was almost or wholly lost. He agreed with Mr. Stack that it was of the highest importance that they should make it clear how high a proportion of blindness in children was due to parental venereal disease; once that was recognized antenatal treatment might be expected to reduce this blindness to small dimensions. He agreed with Dr. Scurfield that an ophthalmic surgeon was a necessary part of the staff of every lying-in hospital. The difference in the incidence of trachoma in Glasgow as shown by Dr. Marion Gilchrist, and in London as shown by his own returns, was striking; it was even more striking when it was known that of two schools formerly fully occupied by trachoma and allied cases from the London Poor Law schools, one was closed and diverted to other uses, and the other half diverted to other cases. He thought there must be some special reason for the difference. Dr. Marion Gilchrist intimated that the number of trachoma cases in Glasgow was due to a Polish enclave. He considered that septic ulcers due to infection of the eyes of coal miners might be largely prevented if there were first-aid stations where foreign bodies might be removed speedily and the eye thoroughly irrigated. Goggles were quite useless for miners, but irrigation of an infected eye of great value and readily arranged.

On a motion by Dr. HAROLD SCURFIELD, seconded by Dr. HARRIES-JONES (Northampton), it was unanimously resolved:

> That with a view to the prevention and adequate treatment of ophthalmia neonatorum in lying-in hospitals each such hospital should have upon its active staff an ophthalmic surgeon.

The resolution was directed to be forwarded to the Council of the Association.

THE ADVISABILITY OF EARLY OPERATION IN STRABISMUS CONVERGENS.

BY

W. B. INGLIS POLLOCK, F.R.F.P.S.GLAS.,

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THERE have been a number of discussions recently upon the question of the proper treatment of strabismus convergens, and various statistics have been published of the results of the different methods of treatment. There have been great differences of opinion on many points, but a practical unanimity is present in regard to the question of the amblyopia ex anopsia. Almost all writers, since the publication of the careful work of Mr. Claud Worth,[1] are agreed that the amblyopia follows the squint and is the result of it. The older view in which we were all trained, that the amblyopia produced the squint, or was accidentally present in the squinting eye, has therefore been given up. Experience has shown that the earlier the squint begins, and the longer it continues, the greater is the amount of amblyopia in the squinting eye, if the onset is before the age of 7.

If the squint is alternating there is no amblyopia, because both eyes are used alternately by the child. The amblyopia develops simply because the child does not use the squinting eye; if it used both eyes it would see double; it unconsciously suppresses the image from the squinting eye, and the earlier that it does so the greater the amount of amblyopia which develops in the eye. After the age of 7 amblyopia may begin, but I have never known of a case in adult life, even after a period of prolonged bandaging, or by the presence of traumatic cataract, but traumatic cataract in an infant almost invariably causes amblyopia should the cataract persist. I have been much struck by the frequent failure of glasses to cure squint, while even when the squint appeared cured, how often is the squinting eye left practically blind or amblyopic.

After trying medical methods of treatment, including training of the squinting eye, I have come to the conclusion that early operation is the best preventive of amblyopia ex anopsia. In a recent paper[2] I quoted the results of early operation in five cases where the visual acuity had been carefully tested several times before and after operation. Each case shows a distinct improvement

in the vision of the squinting eye after operation. In three of the cases the treatment had been aided by occlusion of the good eye for two or three hours daily during several months, but in two of the cases there was no occlusion of the good eye at all.

I have now operated upon over 300 individual patients, and in most of them the earlier the operation has been done the greater the improvement in the vision of the squinting eye. It is difficult, however, to quote statistics, because of the records having been lost, or never been taken, of the visual acuity before the operation. During the war it was almost impossible to take any visual acuity in hospital because the rush of work was so severe.

With regard to the question of glasses, when a child has astigmatism or refractive errors then I advise him to have glasses, but experience has shown that when we give a child a pair of glasses the parents are satisfied and simply trust to the glasses, or the child loses them, and nothing further is done, and when they come back in three or four years the squinting eye is amblyopic. It is much wiser to advise operation, because if the eye is put straight it can be used, and the amblyopia will gradually disappear. The operation must be carefully done, because if there is only a partial success then there is no cure for the amblyopia. When the eye is the slightest degree off the straight then the child still suppresses the image from the squinting eye. To obtain success it is necessary to get the eye perfectly straight, and in many cases it is advisable to occlude the good eye for three hours daily, or use other methods of orthoptic training.

REFERENCES.

[1] Claud Worth: *Squint, its Causes, Pathology, and Treatment*, fifth edition; Baillière, Tindall, and Cox, London, 1921. [2] W. B. Inglis Pollock: Squint, the Question of Early Operation, *Lancet*, 1921, i, p. 1296.

DISCUSSION.

Dr. E. H. HARRIES-JONES (Northampton) asked what kind of operation Mr. Inglis Pollock performed in very young children, and whether advancement *plus* tenotomy was as necessary then as it was later.

Dr. E. H. E. STACK (Bristol) said that cases of squint fell into two categories: those in which vision could be improved, and those in which it could not. The parents should be told whether one hoped to improve vision or merely appearance. Occlusion of some kind should be used first, and one could always tell within a month whether there was going to be an improvement. If there was none, then operation was needed for aesthetic purposes. This was a very important point, as squint was a great handicap to getting a job. If, on the other hand, improvement did take place after occlusion, then glasses and occlusion for six months at least should be tried. He himself did not operate on patients under 5 years of age.

Mr. HERBERT CAIGER (Sheffield) said that a small practical point in regard to occlusion of the sound eye was the need to tell the parents to do it for an hour three times a day, and to do this at meal times, when the child's attention was diverted from its eyes. It was important to make it quite clear to the parents that operation might not improve the vision of the squinting eye; unless this was clear, disappointment would be felt.

Mr. INGLIS POLLOCK, in reply, said that the age at which a squint operation should be undertaken was as soon after the discovery of the squint as it was reasonably possible to do it. We knew that the amblyopia was caused by the squint, and the longer the operation was delayed the worse the amblyopia became. The amblyopia had already commenced in all probability before the parents had discovered the strabismus, as in most cases the squint was intermittent at the beginning. He had operated upon a patient of 2 years of age, and a number at 3 years of age. The first thing was to measure the refraction under atropine, and to decide whether glasses were required or not. If they were required, he liked to have them ready for the child immediately after the operation was done, to put on when the bandages were taken off. He operated by advancement of the external rectus. The important element in the operation was that the stitches should take a grip of the scleral tissue, and they must not be allowed to penetrate the eyeball, as eyes had been lost after such an accident. Another point was that both eyes should be bandaged for a fortnight, to give time for firm union to the sclera. Sometimes a case required a modified tenotomy. Probably every case of strabismus convergens was a case of exaggerated esophoria, and therefore the normal position of such eyes was convergence, which showed that there must be real shortening of the muscle on the side of the squint. No glasses could be expected to shorten the length of the external rectus, or to lengthen the internal muscle. With regard to prognosis, it was important to tell the parents of the child the reason for the operation being done early; and to point out that a second operation might be required in cases of over 25 or 30 degrees of convergence. Most cases came right with one operation, but some required two.

DISCUSSION ON THE TREATMENT OF CORNEAL ULCERS.

OPENING PAPER

BY

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IN this brief introductory paper I do not propose to attempt to deal with the measures which have been used for the treatment of corneal ulcers at different times, but rather to discuss the mode of application and the effectiveness of various methods of treatment which I have employed, or have frequently seen employed by colleagues. It seems to me to be quite futile to discuss methods with which one is not perfectly familiar, and the results of which one has not judged by a fairly wide experience. Very many of you, coming from huge industrial centres, have no doubt a much wider experience of corneal ulcer than I have, and, with wider experience, probably greater success in treatment, but my paper may serve some useful purpose if it merely prompts you to join in the discussion, and, freely criticizing what I have said, to give the meeting the benefit of your experience.

Before tackling the question of the treatment of corneal ulcer, there are two questions that seem to me to require a brief consideration. These are (1) Why is the cornea so liable to disastrous ulceration? and (2) Why is the occurrence of ulceration not even more frequent and more disastrous in its results?

As to (1) the main cause of the vulnerability of the cornea is, of course, the lack of blood supply. Ulceration of the vascular conjunctiva is less frequent than ulceration of the skin, and an ulcer starting on the cornea ceases to spread when it reaches the peripheral vascular zone. As an additional cause, I would adduce the tension of the eyeball, which keeps the corneal tissue tense and unyielding, thus rendering it more liable to trivial punctures and abrasions, so often the starting point of ulceration. From another point of view the infection of the conjunctiva with virulent germs, especially from the tear passages, is of paramount importance as providing the exciting causative factor in ulcer formation.

The whole question of how the cornea is adequately nourished without a blood supply is one of great interest and importance, not only to the anatomist and physiologist, but to the clinician, and has been much studied. In my student days, if my memory does not play me false, I saw wonderfully planned diagrams showing how the nourishing lymph streamed unceasingly through a network of corneal canals. The newer conception of the corneal nutrition hangs mainly on the work of Leber, who, as you know, made the subject of the nutrition of the eye a life-study. Leber denies the existence of any stream of lymph circulating in open channels through the cornea.

It has to be remembered that for the tissues of the eye which are non-vascular and have a purely optical function—that is to say, cornea, lens, and vitreous—the amount of nutriment required must be extraordinarily small. The function of such tissues is static, not dynamic, and the focusing of the rays needs no supply of energy, while the functions of growth and cell reproduction in these tissues, at any rate in adult life and under normal conditions, cannot be at all active. In foetal life, when growth and development are most active, we know that

these tissues have a blood supply. How the cornea and lens manage to grow as rapidly as they do in early childhood has always seemed to me rather difficult to understand.

With regard to the source of the nutriment required by the corneal tissues, one experiment quoted by Leber seems to me to be of great interest—namely, that if the anterior chamber is filled with air which may take several days to absorb, the cornea does not seem to suffer at all. The aqueous apparently has not a great deal to do with corneal nutrition, but Leber thinks its oxygen content may be of value. The cornea lies between two receptacles of fluid, or fluid-containing cavities, the aqueous and the conjunctival sac, but is prevented from absorbing fluid too freely by the stratified epithelium in front and the endothelium behind. The cornea of an eye kept in an indifferent watery solution will long remain unchanged, but if the corneal epithelium is removed the cornea will rapidly swell by imbibition of water. On the other hand, the epithelium guards against drying of the corneal surface, and excessive dryness stimulates the nerves which influence the secretion of tears. The normal water content of the cornea is given by Leber as 76 per cent. We are all familiar with the function of the posterior endothelium in preventing imbibition of fluid from the aqueous into the corneal tissues with loss of transparency. The main supply of nutriment for the corneal tissues probably comes by diffusion processes from the vascular zone at its margin, and the leucocytes, which invade the cornea in all severe inflammatory processes, have, for the most part, the same source of origin.

We all know that an ordinary corneal ulcer ceases to spread when it reaches the vascular peripheral zone, and in all ordinary severe forms of keratitis, if sufficient time be granted, Nature will soon construct a system of blood vessels to carry the means of defence and repair into the inflamed area. Unfortunately, in the severe types of corneal ulceration Nature is not able to bring her reserve defence forces into action so promptly as to avert disaster. Repair is attended by scarring, and we know too well how seriously vision may be impaired by trivial loss of corneal transparency or by irregularity of surface.

(2) The relative immunity of the cornea from ulceration depends on many factors. Among these I might mention the position of the eye in the orbit; the protection of the lids and their quick reflex movements; the cleansing action of the tears, and, finally, the power of resistance to germ invasion provided by the intact corneal epithelium and Bowman's membrane. In all ordinary types of acute conjunctivitis of microbic origin there is practically no risk of corneal complications, except in the purulent conjunctivitis due to the gonococcus. In this disease the invasion of the corneal substance by the germ probably follows the necrosis and shedding of epithelium.

Passing, after these few preliminary and straggling remarks, to the real question of the treatment of corneal ulcer, I propose to consider the treatment of a few typical forms of corneal ulcer. To further simplify what I have to say, I would divide the ulcers into two classes: (*a*) Those in which the causative agent, or influence causing the ulcer, comes from without; (*b*) ulcers in which the state of the patient's health is the main causative agent. It is, of course, understood that in all cases of corneal ulcer the general health factor and the external factor—for instance, a micro-organism—require to be considered.

(*a*) *Ulcers in which the Causative Agent comes from without.*

As an example of this class I shall, of course, cite the ulcus serpens or hypopyon ulcer. Here we have a direct invasion of the cornea by a micro-organism, the pneumococcus in nearly all typical cases. How are we to check this dangerous invasion in the most effective fashion—in the way that will leave the best vision after the ulcer has healed? I have been accustomed to attach special importance to the following principles, most important of all being the necessity for early treatment. The cases, as soon as recognized, must be put promptly under skilled supervision in a hospital. Under the Compensation Act the men are seldom at fault in visiting their doctor whenever this condition threatens—for instance, on the day following a slight injury to the eye sustained at their work. If the eye is reddened and painful, and there is any definite sign of an infiltrate forming at the site of the abrasion, then I think the doctor is at fault if he does not at once send the man to the nearest ophthalmic hospital. Treatment in the man's house is, in my experience, almost always quite futile, and valuable time should not be lost by attempting home treatment.

As in the treatment of so many eye conditions, it is not here so much a question of prescribing suitable remedies as of having them properly applied and having their effect carefully watched. In this type of corneal ulcer, too, the condition of the tear passages always requires careful investigation by an expert, and the state of the intra-ocular tension is often of great importance, especially in elderly patients. As far as I can judge, the doctors in the mining districts, from which our cases of hypopyon are mainly drawn, have become more alive to the necessity of prompt hospital treatment for these cases, but still we have a good many cases coming to hospital with ulcers a week or so old and a large part of the visual area of the cornea already involved. Our worst cases are often in women outside the Compensation Act, in whom the injury which started the ulcer was sustained at their domestic duties. In non-industrial, outlying districts doctors have usually little experience of acute eye conditions, and may allow corneal ulcers to get into a hopeless state before they send the patients to hospital as a last resort. When a case is seen early a cure can almost always be attained with a minimum of scarring and no great damage to the usefulness of the eye, while in cases admitted with a wide involvement of the cornea great and permanent damage to the sight of the eye is inevitable, however successful the subsequent treatment. When we consider how this condition mainly affects highly paid workers, often in the prime of life; how it leads to diminished, or even total loss of, visual working capacity; how the pecuniary loss to the community is swollen by compensation paid to the affected workman for long periods, and often also by expensive litigation, we realize that the question of the prompt treatment of these cases is important from a national or economic as well as from a sentimental point of view.

In the treatment of these early cases one is often successful with the simplest régime. We use frequent neutral saline bathing, atropine drops twice a day, and usually, in addition, a silver salt such as argyrol, 20 per cent., thrice a day. The condition of the tear passages is always carefully investigated and any tear sac trouble treated. The eye is never covered with any sort of dressing or shade at this stage, but a little sterile vaseline is applied to the lid margins. In many early cases treated in this way the ulcer or infiltrate never spreads, the threatening signs disappear in a few days, and the eye soon gets well with very little scarring. If at the end of twenty-four to forty-eight hours the ulcer is found to be progressing, it is touched with pure carbolic. We apply the carbolic on the sharpened end of a wooden match and rub the carbolic well into the spreading margin, where there is usually some undermining. If the spread looks severe and threatening, I personally prefer the cautery even at this stage, and I generally use merely the hand cautery, as it seems to cause less destruction of tissue and can be applied very accurately. (I always use a Zeiss × 3 stereoscopic magnifier when making any application to an ulcer.) In the vast majority of cases one can count on checking the spread of an ulcer at this stage with either of these agents. Sometimes one finds a small part of the margin of an ulcer continues to spread, and a second application may be necessary. Of the rarer cases, in which these agents have signally failed, I will speak later.

For cases seen in a rather more advanced stage, if the ulcer does not look very active, one may with advantage wait twenty-four hours at least and note if there is any spread. Some of these cases get well on the ordinary routine treatment with argyrol and atropine. If the ulcer appears to be very actively spreading I approve of the cautery as being the most certain and effective remedy. In the cases where the ulcer is large—say 4 mm. or more in diameter—and actively spreading, there is usually a considerable or large hypopyon. In these cases I use the cautery first and then puncture the anterior chamber from below, evacuating the hypopyon by pressing back the posterior lip of the little wound.

The Saemisch's section is, I consider, a very valuable method of treatment in very severe cases where the cautery has failed to check the spread of the ulcer. I have also found it very effective in cases of smallish

ulcers with a very purulent infiltration extending deeply into the corneal substance. In this last type, which is rare, I prefer it to the cautery, as the section need not cause any iris entanglement, and there is not the same destruction of tissue as caused by free, deep cauterization.

In cases with obvious dacryocystitis, I believe that the best thing to do is to excise the tear sac as a preliminary to treatment of the ulcer. As the patient has suffered a good deal, and is often dejected and miserable, this treatment may appear too drastic, and one may be content to pass a probe and wash the sac out regularly. I do not think that reinfection is very common after the use of the cautery. It is also very extraordinary how one can incise an eye with acute ulcus serpens and evacuate a hypopyon without fear of a general infection of the eyeball, while to have freely opened the same eye before the ulcer started would probably have had most disastrous results.

With regard to alternative methods of treatment by other powerful physical or chemical agents, I am familiar only with two, ionization and heat, applied either with the cautery not actually in contact with the cornea, or with a special instrument. Dr. Traquair tried ionization extensively before the war, and this method appeared to give very good results. He will describe the method he adopted and discuss its suitability for different types of ulcer.

With regard to heat, I have recently often combined the method of actual cauterization with holding the cautery very close to less infiltrated areas of the ulcer. Dr. Sinclair has used a special thermophore of American design, and reports favourably on its use. I have not given the optochin treatment a sufficient trial to express any opinion of its relative value as a method of treatment. Some day the serum treatment may prove to be the ideal treatment.

In Edinburgh we have always found a small proportion of ulcers which resist treatment and prove very difficult to check. One type, which is specially troublesome, is when a patient, often well up in years and somewhat feeble, is admitted with a large, but not very active, ulcer of perhaps a fortnight's duration. The cautery is used, and next day the eye is much worse, with a freshly chemotic conjunctiva, and the ulcer showing a fresh yellow margin of active corneal invasion round a large part of its circumference and increased hypopyon. Further cauterization with evacuation of the hypopyon may be tried, but, on the whole, I prefer the Saemisch section, though this method also may fail.

In the clinic here, as already indicated, we have always been accustomed to leave eyes uncovered until the ulcer had cleared and reinfection was hardly to be feared. I have then found a pressure bandage useful, especially in cases of perforation with leakage from the anterior chamber. The chief complication we have had to deal with, and one which has caused the loss of many eyes, is increased tension and staphyloma in cases where there has been widespread corneal destruction. Iridectomy is only of moderate value in reducing the tension in these cases, but trephining has given us better results.

In cases of ulcer with hypopyon in children I have never used the cautery or carbolic. Nearly all these cases get well quickly with atropine and the good hygiene and diet of a hospital ward. This type of ulcer tends to perforate rather than spread widely. In some cases it seems advantageous to anticipate perforation by puncture of the floor of the ulcer. In the ulceration of gonorrhoeal ophthalmia, whether in children or adults, I have never used the cautery or any strong chemical agent, because I am afraid to reduce further the resistance of the tissue in the presence of so virulent a germ.

With regard to the marginal ulcer of the cornea, this type of ulcer is not very common in Edinburgh, so my experience is limited. I have seldom used the cautery in these cases, but several times employed paracentesis with good effect. For many years I have not used eserine in corneal ulcers for such a purpose as preventing iris prolapse, and I do not think its use for this purpose is in any way effective.

(*b*) *Ulcers depending mainly on the State of the Patient's Health.*

Strumous ulcer of the cornea: In my experience this form of corneal trouble was much commoner and more severe twenty years ago than it is now. This I attribute to several factors, among which I may mention the general improvement of social conditions amongst the poorest classes and some better understanding of the diet and treatment of children; the more thorough surgical treatment of tuberculous glands and tuberculous diseases generally amongst children; and, finally, the medical inspection of school children combined with medical treatment in the school clinics and the feeding of necessitous children. Only a small fraction of these cases as we see them now are of a really severe type. In the treatment we are much handicapped by having so few children's beds available. In the cases with extreme photophobia efficient treatment can seldom be carried out at home, and there can be no adequate supervision of the diet and hygiene.

I am accustomed to treat these cases in the ward on the simplest lines. If the symptoms are acute the children are kept in bed, are given a simple purgative, and next day are put on small doses of grey powder or calomel. In many of the cases the chief error of diet seems to be an excess of starchy foods, the mothers constantly giving the children sweets and sweet biscuits to keep them quiet. Locally atropine is used, and I am one of those who believe that it does a great deal of good. When the condition has passed the very acute stage the atropine is combined with yellow oxide of mercury ointment, one-half to one per cent. A great proportion of the cases do so well on this simple régime that I have seldom been tempted to vary it much or to have recourse to tuberculin or other vaccine treatment, though in obstinate cases I have found this form of treatment of considerable value. Very many of the children require surgical treatment for tonsils and adenoids and for tuberculous glands.

What is needed in Edinburgh, and I fancy in many other places, is some sort of convalescent home or sanatorium where those children with recurrent strumous ulcers could be sent for a considerable time, so as to have their health thoroughly established.

The disease appears to me to be much neglected and badly treated by the men practising in poor-class districts, where it is common. Finding themselves unable to cope with the factors which lead to bad hygiene in the home and bad feeding of the children, they prescribe tonics, malt extracts, patent foods, etc., without real benefit.

Herpetic ulcer of the cornea: I have been accustomed to see this condition in two forms. In the first form there is a large exfoliation of epithelium, and the fluorescin stain shows a large irregular area denuded of epithelium. Left to themselves, these cases make very slow progress and the affected individual has much discomfort and is unfit for work. I believe in treating the affected area by the application of absolute alcohol. I apply the alcohol on cotton-wool wrapped round the edge of a match or probe, and apply it not only to the denuded area, but to any neighbouring epithelium loosened or diseased. I then put in a drop of atropine and apply a bandage. Very rapid improvement usually results from this form of treatment, and I have often seen cases, which had lasted for weeks, make a very rapid recovery. Sometimes there is recovery over a large part of the affected area, but at another point the healing is unsatisfactory, and a second or third application of alcohol may be used.

The second type of herpetic ulcer, and one which we see more commonly, is the typical dendriform ulcer. I am accustomed to treat this ulcer also by the application of alcohol, and have found this treatment, on the whole, very satisfactory. We seemed to have a great many cases after the severe epidemic of influenza, and some of these cases proved obstinate, though eventually healing without much scarring. In my experience the application of alcohol to these herpetic ulcers should always be made in a fairly drastic fashion, otherwise it is ineffective. With regard to Mooren's ulcer, I have failed in several cases to check the ulcer with any form of application. In one case which appeared to show this type of ulcer in the early stage the application of alcohol achieved a rapid and lasting cure.

There is one other form of ulcer which I would like briefly to mention, and it is one which is seen fairly frequently in Edinburgh—namely, the superficial recurring ulcer associated with rosacea of the face. Even with the co-operation of the physicians of the skin department I have found these cases very difficult to treat effectively, and I should like to hear the experience of others with regard to the treatment of this tiresome form of ulcer.

DISCUSSION.

Dr. H. M. Traquair (Edinburgh) referred briefly to the results which he had obtained in the treatment of hypopyon ulcer of the cornea by ionization with zinc. The method was efficient for that form of ulcer except in the more severe cases, in which more experience was required. In the cases treated the duration in hospital was below the average and the visual results were better than those following treatment by other methods.

Mr. N. B. B. Flemming (London) said he was introduced to the treatment of corneal ulcers by magnesium sulphate by Colonel Kirkpatrick in Madras, and in subsequent experience had found it very valuable. He used a saturated solution in an eye-bath, and kept it in contact with the open eye for five minutes every two or four hours. The action was osmotic and bactericidal, and was most efficient in chemotic conditions of both cornea and conjunctiva, such as large corneal ulcers and abscesses, and in gonorrhoeal ophthalmia in adults. Another method of treatment valuable in severe marginal ulcers was the subconjunctival injection of colloidal iodine in doses of 2 to 3 minims twice a week; this was a treatment which he had found of most striking value in slight wound infection with iritis following an operation such as cataract extraction, but he considered it worthy of mention for application in corneal conditions also. He saw a large number of cases of keratomalacia in marasmic infants in India whose malnutrition was due to prolonged breast feeding—two to three and a half years—by semi-starved mothers. In these cases there was no true laceration, but the cornea degenerated and eventually sloughed off. When seen sufficiently early, treatment with good milk, cod-liver oil, and fruit juice proved very satisfactory. Concomitant degeneration of the lens was not observed in these cases. It interested him to find in a few cases of cholera that a crop of corneal ulcers occurred early in convalescence, very similar to what was found in measles, and no doubt due to the lowered condition of the patient's health rather than to the infection. Early carbolization of these ulcers was invariably successful.

Mr. T. L. de Courcy (Liverpool) said that in the Liverpool Eye and Ear Infirmary they had been using vaccines largely in the treatment of strumous children. Dr. Cronin Lowe, their bacteriologist, took swabs from most of these children and prepared stock vaccines to suit the type of ulcer, and these were given weekly after suitable treatment to the nose and throat, such as removing tonsils, adenoids, nasal polypi, etc. It was difficult to be dogmatic as to the results, but on the whole recurrence seemed to be less frequent and the ulcers cleared up more quickly.

As regards hypopyon ulcers, they had also been using chauffage largely and with very good results. The points of the electro-cautery were used from a multostat, and were brought as near as possible to the ulcer without touching it; this was done daily till improvement took place, following, when necessary, Saemisch's section or paracentesis. He frequently used dionine associated with atropine. The use of dionine was debatable, but if used in strong enough solutions—5 per cent.—and provided a good reaction was set up, it seemed to be useful. Subconjunctival injections of oxycyanate of mercury were also useful, particularly in ulcers near the margin of the cornea.

Mr. Bishop Harman (London) said that he had given up the use of the actual or electric cautery for hypopyon ulcers for some time. However delicately it was used it appeared to him to extend the resultant scar, and he did not find that it checked the spread of the ulcer better than less drastic measures. He advocated free irrigation, the use of hydrogen peroxide, and leeching. He commented upon the recommendation of Dr. Paterson—that these eyes should not be covered but treated by the open method. That certainly seemed good in the face of the fact of infection, but an infected cornea was a frail tissue and seemed to be aided by warmth, for which reason he preferred constant fomentation. The caustic substance he found of greatest service was known as pheno-camphor, a mixture of pure carbolic acid and camphor; the two solids were placed together in a bottle and liquefied each other. The liquid was very penetrating, a most efficient antiseptic, and singularly free from destructive effects. He applied it with a pointed match, stubbing the fluid into the edge of the ulcer, deep into the epithelium. Although he did not use the actual cautery for hypopyon ulcers, he did use it for the chronic vascular ulcers of children—the so-called strumous ulcer. If each of the vessels entering into such an ulcer was just touched by the point of the cautery a short distance on the conjunctival side of the limbus, the effect of the stoppage of the abnormal blood supply was magical in its curative effects.

Dr. John Hern (Ophthalmic Surgeon, Darlington Hospital) said that in regard to hypopyon ulcer he always used argyrol 25 per cent. with uniformly good result. The acid treatment had usually failed in his hands. He was doing the Saemisch section in severe cases only; but always through the ulcer, as often one saw escape a piece of tissue which appeared to him to be too dead to remain and too living to be easily thrown off; this released, at once the case improved. It was important to have as little of the cornea affected as possible, so as to have a thin scar; this could only be done by getting the cases early, and treating them carefully. In the very chronic ulcer of middle-aged people a stitching of the lids together for fourteen days had often given him most encouraging results.

Professor Wardale considered that argyrol was of very little use as a germicide, and that a 2 per cent. solution was as good as one of 25 per cent., and cheaper; but it was of great value in that it was dirty stuff, and as long as there was a trace of it in an eye the patient saw queerly; if an adult, he would not be happy until he had washed it away, or those parents who took any interest in their children would not be content until the eye was washed clean. In pneumococcic ulcer he had tried vaccine treatment, and used the vaccine both locally and hypodermically, but got no useful result. He had used a broad flat cautery to scorch the ulcer, and when that failed he cauterized the ulcer directly. Celluloid shields were a great danger to ulcerated eyes; they were worn over one eye until the lid became oedematous and fissure formed. It was better to bandage the good eye, so as to compel the child to open the bad one. Dionine, in full strength, was of service.

Dr. E. H. E. Stack (Bristol) considered, when argyrol was used for the treatment of an ulcer, if staining of the base of the ulcer ensued there appeared to be a better prospect of recovery. Hypopyon ulcer cases fell into two categories: those which improved very much in the first twenty-four hours with atropine, and those which did not, the latter cases being those which required the use of the cautery. Over-lactation was a very common cause of corneal ulcers in the mother; usually they were started by some slight injury.

Mr. Inglis Pollock (Glasgow) supported the speakers who applied moist heat in these severe hypopyon ulcers. It was best applied, he considered, by means of hot fomentations, repeated four times daily. The cautery should not be applied directly to the cornea; it might be brought close, but not allowed to touch the tissue. Paracentesis was a valuable aid in such cases. There was often increased tension, and the reduction of pressure aided the natural circulation of fluid in the cornea. Sometimes it was well to reopen the corneal wound on the following day. This might require to be repeated several times. The teeth of these patients should be examined and the dentist called in if necessary; their general health was also important. Many of these patients were tired and exhausted when they came into hospital. Strychnine and iron was frequently beneficial, and it was well not to forget calomel and magnesium sulphate internally.

Mr. A. S. Percival (Newcastle-on-Tyne) said that he always used quinine with the atropine drops (quin. hydrchlor. gr. viii to the ounce of ¼ per cent. or ½ per cent. atrop. sulph.). In the simple cases of a non-perforating ulcer with hypopyon (presumably sterile pus), he had found that the hypopyon disappeared in two or three days. If the quinine were stopped and the atropine continued the hypopyon reappeared; on repeating the quinine the hypopyon disappeared. He had done this three times in succession. For this reason he had always ordered the quinine drops to be used for a week after the disappearance

of the hypopyon. He had first been advised to use quinine externally and internally by Dr. Edgar Stevenson of Liverpool many years ago. With regard to paracentesis, he was always afraid of meddling in this way with a sterile hypopyon. Of course, he used a keratome if the hypopyon rose too near the level of the pupil. After the paracentesis the hypopyon was always septic. If the hypopyon were septic when first seen there need be no hesitation in doing a paracentesis whenever it was called for.

Dr. H. P. Bennett (Newcastle-on-Tyne) said for routine treatment he preferred hot bathing every hour or two, the use of atropine with argyrol and magnesium sulphate lotions. Paracentesis was beneficial if the tension of the eye was at all increased after cauterization. For ulcers associated with rosacea of the face magnesium sulphate lotion 4 per cent. seemed to give the best results.

Dr. D. Matheson Mackay (Ophthalmic Surgeon, Hull Royal Infirmary) said he regretted that no new treatment of corneal ulcers seemed better than the old treatment. He was treating hypopyon ulcers as Mr. J. V. Paterson was, but he thought often that he ought to be more rather than less drastic in his applications, and not seldom regretted that he had not incised an ulcer earlier, whereas he never felt that he had incised one too early. He was in the habit of cauterizing with liquefied carbolic acid, applying it on a minute wool swab, and was not concerned if it ran over the healthy cornea, for he found that no permanent marking remained, the scar being limited to the ulcer. He had, earlier, used atropine and quinine drops, but did not think them better than atropine drops alone. However, after Mr. Percival's testimony, he intended to try them again. Lately he had been using magnesium sulphate lotion up to the strength of saturation, and patients seldom complained of pain from it. He believed it was an old method of treatment resuscitated, and that it was distinctly encouraging in its effect upon such ulcers. On the whole, unless rest in bed and instillation of atropine caused improvement, he noticed that in spite of more drastic treatment the eyes often did badly.

In his reply Mr. J. V. Paterson said he was very pleased that there had been free criticism of his remarks and so many suggestions offered. He agreed with Mr. Mackay that it was often difficult to make up one's mind what to do in obstinate and severe cases, but he adhered to his statement that the Saemisch section saved certain eyes when even the cautery had failed. He meant to try Mr. Bishop Harman's method of cauterizing the leash of vessels which passed over the cornea in certain types of severe recurring phlyctenular keratitis. He would also try the magnesium sulphate solution which several of those present had advocated. He fully agreed as to the great importance of nose and throat treatment in many of these children. He agreed also with Mr. Pollock as to the value of paracentesis in hypopyon ulcer, but in the severe cases he thought it advisable to cauterize the ulcer just before tapping the anterior chamber.

AUTOTOXAEMIA IN OPHTHALMOLOGY.

BY

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It is established that occasionally there is some connexion between septic foci and eye diseases. We know that microbes, without causing much general disturbance, may be transported in the blood stream to any part of the body and there produce disease. We also know that toxaemias —microbic, metabolic, and chemical—affect the eyes in various ways; they lessen the natural defences, they cause disorder or disability of function, and they cause degeneration of tissues. Further, we cannot ignore the statement of Sir William Arbuthnot Lane[1] that in intestinal stasis "the eyes are always affected and that they afford a delicate indication of the degree of auto-intoxication." Many ophthalmic surgeons believe that toxins, without the presence of microbes in the eye, may produce active inflammation of a more or less destructive nature, such as we see in some cases of iridocyclitis, some cases of post-operative infection, etc. Other diseases—for instance, arthritis and pericarditis—are occasionally found to be microbe-free, and it is accepted that the inflammation in these cases is caused by toxins.[2]

Perhaps one or two additional observations drawn from general surgery may not be without interest on account of their associations. During the war we often saw the dry, plastic wounds associated with septicaemia, and they reminded us that a bacteriaemia or a toxaemia may completely alter the character of a wound and inhibit the healing process. The unhealthy condition of the wound was always contemporaneous with the bacteriaemia. In septic and infective conditions the synovial membranes, the serous membranes, the conjunctiva, ciliary body, and iris, are specially liable to suffer from disorder or secondary infection. These secreting structures become excreting structures, and their excretions contain microbes or their toxins. We can regard the conjunctiva and ciliary body as structures allied to synovial and serous membranes. The following case may serve as an illustration:

The injured foot of a soldier became swollen and septic. Three weeks later the knee-joint on the same side became distended and had to be opened. Two weeks later still the other knee-joint also became distended and had to be opened. The fluid from the first joint was "sterile," that from the second contained *Staphylococcus aureus*. All through the illness the man suffered from acute bilateral conjunctivitis with some involvement of the deeper eye structures. Lotions, atropine, etc., had but little effect on the condition of the eyes. They recovered contemporaneously with the joints.

Long ago Mr. Sydney Stephenson suggested[3] excretion of toxins by the ciliary body as a good working hypothesis to explain the production of iritis and cyclitis. We have also to remember that endogenous toxins may act on the eyes over a long period of time. Soluble substances pass easily and quickly through the cornea, and while there may be microbes yet we do not associate toxins with a healthy conjunctival sac.

Some years ago I operated for cataract on a rather stout old lady, who had been living an ordinary but rather sedentary domestic life. As her urine was muddy from the presence of urates she was sent on holiday, urged to take exercise, and to regulate her diet. After some weeks she was admitted to hospital. The usual precautions were taken and the cataract removed. She made a good recovery and was sent home. Two months thereafter she got her glasses and with these she could see to read the newspaper. A few days later the eye became irritable and red. One of my colleagues examined the eye with me, but we did not discover any defect or flaw in the operative procedure. There was no prolapse of iris. The inflammation went from bad to worse and the eye ultimately became blind. At a later stage it was removed. About two years from the date of the operation the cataract was removed from the other eye by another ophthalmic surgeon, who a few months thereafter informed me, "for my comfort," that the second eye had gone the same way as the first.

There can be little doubt that the cause of the destructive, non-suppurative inflammation in this case was endogenous. Probably Lane and his fellow workers would say that the cataract itself was due to the same autogenous quantity.

A focus of quiescent microbes, or it may be a focus only of lessened resistance due to operative or accidental trauma, may have its quiescence interrupted and converted into active inflammation, or into that form of iridocyclitis that leads to sympathetic ophthalmia. Of all the intraocular structures the ciliary body and iris are most liable to be affected by microbes and toxins, and when affected their resistance to treatment may be due to our inability to recognize the toxin or its source. Superficial diseases of the eye are in many cases but the expression of local resistance to microbes and toxins. Gouty conjunctivitis is an example of metabolic toxaemia. Occasionally in gouty people, or people who eat too freely, we get a dry, slightly painful condition of the conjunctiva, or it may be small cutting particles under the upper eyelid. We may suspect that a foreign body, unknown to the person, has got into the eye, but these particles are probably composed of sodium urate.

A busy business man, who spent most of his time in his office and who took little exercise, came to me complaining of conjunctivitis. He also had a patch of eczema on the lower part of his face, and his breath was offensive. His treatment was low diet, uncooked vegetables, laxatives, and vigorous exercise in the garden. Within a week all his disorders had disappeared.

Lane states[4] that auto-intoxication produces "degenerative processes in the lens and loss of power in the ciliary muscle." Mr. Treacher Collins has demonstrated[5] the relationship between parathyroid deficiency and lamellar

cataract, and McCarrison the relationship between the thyroid and toxaemia. In the etiology of lamellar and senile cataracts we may yet observe converging lines. Toxaemia may also supply a working hypothesis to explain obscure cases of primary optic atrophy and other diseases of the eye.

Is there any causal relationship between toxaemia and ocular discomfort, with or without error of refraction? The loss of accommodation in toxaemia is admitted. Some people get relief by having small errors of refraction corrected, errors that at one time caused no trouble and may again cause no trouble when the correction is withdrawn. Similar errors in other people cause no discomfort. In many cases relief is not obtained, even when small errors are corrected. Some ocular defects are hysterical and some discomforts are neurasthenic. There is a nervous or sensitive temperament, and there is the antithesis of this; but there still remains a toxic group, and these are not relieved by correction of refractive errors alone. These cases require dieting, laxatives, exercise, and change to coast or country.

As a guide to the presence of toxaemia the examination of the blood, urine, and faeces may yet become more helpful in difficult cases. The odour of the breath is not without significance as an index of the condition of the blood. In uraemia and diabetes the odour is characteristic. Offensiveness in itself, unless the teeth are very dirty, is suggestive of toxaemia. The following case may be apropos:

> During the war a soldier fell from his horse, and in falling struck his abdomen. Three days later he was admitted to hospital complaining of abdominal pain. No abdominal swelling or fluctuation was made out. Occasionally he vomited, and his temperature fluctuated from 100° to 102°. His breath had a peculiar offensive odour. It was not the same as that from a gangrenous lung, yet it had a penetrating odour not unlike it. After being under observation for some days the abdomen was opened, when it was discovered that his spleen was ruptured and that there was much blood clot behind the stomach. Here the absorption of stale blood from the peritoneal cavity polluted the blood stream and rendered the breath offensive.

In dealing with toxic cases, or cases that might become toxic, it is well to keep McCarrison's work in mind. He informs us that the thyroid gland "has antitoxic action and defends against autotoxin and against disease producing microbes and injury by their products."[6] Also that in hypothyroidism "toxins have free play to exercise their deleterious action on the various organs and tissues."[7] The importance of the accessory food factors or vitamins also calls for consideration. Keratomalacia is one of the consequences of this deficiency and the remedy is cod-liver oil. "Vitamin deficiency renders the body liable to be overrun by the rank growth of bacteria,"[8] and leads to degeneration of every tissue in the body. I suggest that toxaemias—microbic, metabolic, and chemical—in the onset of some forms of ophthalmia play a larger part than is generally accepted. If iridocyclitis or other disease of the eye is due to a remote source of toxaemia, or is but a manifestation of another disorder, one may ask if the ophthalmic surgeon is the person best qualified to deal with it. I commend Dr. Batten's suggestion[9] that we should have on the staff of our hospitals an ophthalmic physician. Co-operation, as expressed by that agricultural term team-work, is required if we are to make satisfactory progress in ophthalmology. Much of our disease is a discredit rather than a misfortune. Perhaps when we are able to give more consideration to the etiology, beginnings, and prevention of disease we may reduce the number of patients with more or less hopelessly damaged eyes that to-day haunt the outdoor departments of our hospitals.

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DISCUSSION.

Dr. MOORE (Gateshead) stated that he had known and treated a case of iridocyclitis which did not react to ordinary methods of treatment over a prolonged period. History revealed the fact that the patient had had previously an ordinary gonorrhoea; the appropriate vaccine was administered over a period of seven weeks without other treatment, and was followed by complete recovery.

Mr. INGLIS POLLOCK (Glasgow) mentioned the case of an old schoolmaster with tobacco amblyopia who cured himself, on his son's suggestion, by having all his teeth replaced with artificial sets. He refused to give up his tobacco. The cure was apparently due to the improved mastication and nutrition.

Dr. JOHN HERN (Darlington), referring to the subject of autointoxication, said that certainly cases did occur, especially in septic conditions of the mouth and teeth. He had charge of a venereal diseases department for four and a half years, and although he watched carefully in gonorrhoea for affection of the eye he found none; but in syphilis he was much impressed with the frequency of affections of the eye.

Mr. A. S. PERCIVAL (Newcastle-on-Tyne) gave a striking instance of recurrent iridocyclitis which was not due to oral sepsis, but recovered almost completely three days after an internal ureterotomy by Mr. R. J. Willan, to whom he had sent the patient as he gave some symptoms of an old stricture. He asked whether any of the members present had tried radiant heat. In cases of old iridocyclitis in which an iridectomy was urgently called for such an application was usually unsuccessful, as the iridectomy wound was filled up with plastic exudation, which perhaps left the eye in a worse state than before. He had tried a preliminary course of radiant heat in some of these cases, which appeared to be invaluable in determining the presence of occluded sepsis. When there was no persistent irritation after the radiant heat one might reasonably expect that the operation could be done with much less fear of subsequent inflammation. He had had much better results than he had expected after using this method.

Dr. D. MATHESON MACKAY (Hull) said he thought that all ophthalmic surgeons would agree with the thesis propounded in the paper, and that all were treating their patients on the assumption that many eye affections were due to autointoxication—notably toxins from dental caries, gonorrhoea, and rheumatism.

NODULAR KERATITIS OF SOUTH ARABIA.

BY

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THE disease I have called, for want of a better name, nodular keratis of South Arabia, is one which in its commoner forms is a peculiar and striking condition. A patient, usually middle-aged, comes complaining of dimness of vision which is less marked at night. On examination he is found to have a group of nodules occupying an area in or below the equator, and usually including the centre of the cornea. In most cases the condition is present in both eyes, though the position of the lesion may not be the same in each.

These nodules in typical cases are perfectly transparent and are covered by normal epithelium. They are often closely grouped together; I have counted as many as twenty-five in an area of 4 by 2 mm. On the other hand, there may be only a single nodule present. There may be no opacity of the cornea, no suggestion of leucoma, and nothing to indicate that there has been any previous ulceration. The cornea is not vascularized, the sclera looks perfectly normal, there are no enlarged vessels at the corneo-sclerotic margin and no injection of the conjunctiva. The iris reacts to light and shows no sign of previous inflammation, and if it is dilated to enable one to examine the fundus, that also proves to be perfectly healthy. The only abnormality is this little group of glassy nodules of various sizes, the largest having a diameter of somewhere about 1 mm. and projecting about the same distance from the surface of the cornea. Examined with a lens from the side, they look like a group of round-topped mountains on a raised map or the mounds that an active mole might make on a smooth lawn.

When one examines a series of cases other points arise. The nodules are not always transparent, some or all may be slightly white and opaque; while the cornea between and around them may not be clear but may show leucomatous change, or may even stain in parts with fluorescin, indicating the presence of active ulceration. As a rule the ulceration present is of a superficial nature, but in one patient who was admitted to hospital for a hypopyon ulcer of moderate severity it was noted after the ulcer had healed that one nodule was present in the cicatrix.

The grouping and position of the nodules also varies. The cases of which I have notes number 16, and of these both eyes were affected in 9 cases, giving a total of twenty-five eyes. In twenty of these twenty-five eyes the pupillary area was affected by the disease. The lesions were roughly circular or oval in 20 cases; in the one following the hypopyon ulcer there was only one nodule; in two others the outline was quite irregular, while in two it was linear. One of these latter was a very striking case—five nodules were present in a straight line right across the equator, one being almost central with two nodules on either side. The area affected was not always covered with nodules, as in the case I have described as typical. In several cases the nodules formed a rough circle or ellipse, with either clear cornea or a patch of leucoma occupying the interior of the area.

With regard to concurrent disease of the eye, slight pterygium (a very common condition in these parts) was present in six of the cases. One patient had trachoma and trichiasis, also common diseases. One had signs of old iritis, while another was completely blind. He had posterior synechiae and cataract, and was probably syphilitic. None of these diseases had apparently any causal connexion with the corneal condition.

The disease is much more common in males; of these 16 patients only one was a woman. Eight of the 16 were Arabs, 7 were Somalis, 1 was a Soudani. In reference to occupation, a noteworthy fact is the high proportion—50 per cent. of the cases—of men working by or upon the sea. One was the captain of a dhow, one was a pearl fisher, another a quarantine worker at Perim who spent much of his time on the sea, while five were fishermen. All the others, with possibly one exception, were dwellers near the coast. As a large proportion of our other patients came from the hills of the interior, the fact that all of the cases of this disease of which I have notes came from the coast or the plains, suggests that something in the conditions of life in the low-lying regions may be an etiological factor. The coast of South Arabia in the Aden region is mostly desert, covered with dry, salt-impregnated sand, which during the monsoon months is constantly being blown about. Day after day for hours at a time one lives in a constant cloud of dust. From time to time the monotony is varied by a real sandstorm, when the sand which the daily winds have blown inland is returned with interest by a hurricane blowing towards the shore with such intensity that the sand is carried miles out to sea, and ships enveloped in it may be as helpless as in the fogs of more northern latitudes. In the hills these conditions do not exist. There are large areas of cultivation; there is a considerable rainfall, while that at the coast is almost negligible; instead of sandstorms there are thunderstorms; and if, in a dry season, the dust is raised by the wind, it is ordinary dust and not the salt-laden dust of the plains. My theory may be quite wrong, but I put it forward as a suggestion—that exposure to the salt-laden dust is a factor in the causation of the disease.

With regard to the age of the patients, the disease is chiefly one of middle and late life. None of the patients were under 30 and only four under 50. Ten were between 50 and 65. I have no note of the ages of the other two, but both were adults.

In reference to the frequency of the disease, I regret that it is impossible for me now to give accurate figures. In three months of 1913 I have notes of 7 cases of the disease. In that year I operated on 60 cases of cataract, probably about 15 of them during the three months in question, so that one might roughly say that operable cases of cataract were twice as numerous as cases of this disease. Our hospital, the Keith Falconer Mission Hospital at Sheikh Othman near Aden, was a general hospital at which about 10,000 new patients were seen each year, and of these probably some 1,500 were eye cases. These figures are subject to correction, but I imagine I am not far wrong in saying that of every 200 cases of eye diseases seen not more than one or two would be of this form of keratitis.

The effect of the disease on the patient's vision varies with the position of the nodules. When they involve the centre of the cornea the effect is of course very great, the irregular surface breaking up and distorting the entering rays of light and making the patient as blind as would a dense patch of leucoma in that area. These cases always state that their vision is worse by day than at night, the reason of course being that the pupils are wider at night and allow some rays of light to get through unaffected portions of the cornea.

With reference to the differential diagnosis, there are several known diseases in which nodules are found in the cornea:

1. *Keratitis punctata superficialis* has some points in common with this disease. But it is usually a disease of young people, while my patients were mostly old; the spots gradually disappear after some months, while in the disease I have described the nodules had often been in existence for years and had every sign of permanence; and in the descriptions I have seen of keratitis punctata superficialis there is no suggestion that the spots are limited, as in my cases, to the lower half of the cornea. The nodules in keratitis punctata are described as dull, owing to the epithelium being raised over the grey spots, while in many of my cases the striking feature was the transparent glassy character of the nodules.

2. In *nodular opacity of the cornea*, which is associated with the name of Groenouw, there are larger spots in the centre and smaller in the periphery of the cornea, while between the spots there is a faint uniform cloudiness. Both are points of difference from the nodular keratitis I have described.

3. *Dystrophia epithelialis corneae* is also quite a different disease. It consists of a diffuse opacity, most intense in the pupillary area and fading off into normal cornea towards the periphery, simulating a glaucomatous opacity. The nodules are vesicular elevations which stand out as black spots on the opacity.

4. Finally, there is *dendritic keratitis*, a form of *herpes corneae febrilis*, in which, as the name indicates, there is a superficial ulceration of the cornea, branching in a tree-like manner, often with nodules at the extremities of the branches. This is frequently associated with, if not due to, malaria, a factor which is always possible in South Arabia. But the descriptions of dendritic keratitis do not at all correspond with the Arabian disease.

In regard to the origin and course of the disease I have little to offer but theory. In three of my cases some superficial active ulceration of the cornea was present; two had a history of injury; one patient gave a history of attacks of pain in the eye over a period of six or seven years; while the position of the lesions, on and below the equator of the eye, corresponding to the usual sites of corneal ulceration, suggests that the disease may begin as a superficial ulceration. Further, the fact that where there was a dense leucoma present the nodules were usually on the periphery of the scar suggests that if the hypothesis of an original ulceration in every case is correct, for some reason or other the nodules only form in parts where the ulceration is of a very superficial nature. Whether they are the result of the embedding in the superficial layers of microscopic particles of salt or sand which act as an irritant and stimulate the cornea to envelop them, somewhat on the analogy of the grain of sand which is said to be the origin of the pearl in the oyster, must be left to the future to determine.

ACCORDING to the *Japan Medical World* the plague epidemic which had prevailed in Manchuria for nine months from September, 1920, caused a total of nearly 8,000 deaths. The preventive organization which is credited with having brought the epidemic to an end in this comparatively short time was dissolved on July 15th. A quarantine blockade was instituted between north and south Manchuria, with a staff of Japanese and Chinese medical examiners and bacteriologists; trains were inspected and travel of all kinds between the two parts of the country was strictly supervised.

ERYTHEMA NODOSUM: AN ACUTE SPECIFIC FEVER.*

BY

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I PROPOSE briefly to review the evidence that can be adduced in favour of regarding erythema nodosum as an acute specific infectious fever comparable in every way to the zymotic fevers.

The matter is one of very great importance from a national point of view on account of the varied theories that have been held with regard to the nature and causation of the disease. Briefly, these theories are:

1. That erythema nodosum is a manifestation of acute rheumatism.
2. That it is a cutaneous manifestation of a general intoxication due to several widely different causes.
3. That it is tuberculous in origin, a septicaemia due to attenuated tubercle bacilli.
4. That it is a manifestation of syphilis.

Obviously, if erythema nodosum could be proved to be an early manifestation of tuberculosis or of acute rheumatism, it would enable us to take precautionary measures in the case of persons who have suffered from it, and possibly so to avert later attacks of phthisis or carditis—two conditions which levy so heavy a toll upon the young adult life of the community.

It is not my present purpose to criticize these theories, but it is necessary to make a few brief remarks in regard to them.

The cases of erythema nodosum associated with syphilis have been reported chiefly in German and French journals, and these have been published with the view of showing that the disease is of syphilitic origin without considering the possibility of a symbiosis. Altogether the evidence is far from convincing.

The rheumatic origin of erythema nodosum is still taught in English textbooks, but the evidence brought forward in its support is not very satisfactory. In the following table I briefly summarize the chief differences between erythema nodosum and acute rheumatic fever:

Erythema Nodosum.	Acute rheumatic Fever.
Age incidence: Second and third decades	5–10 years.
Seasonal incidence: Second and last quarters	Third quarter.
Some evidence of infectivity and epidemic occurrence	Very little.
Relapses and recurrences rare	Frequent.
Endocarditis rare	Frequent.
No relief of fever or arthritis from salicylates	Relief.
Phlyctenulae in about one-third of the cases	None.

In a series of 48 cases seen at the Bristol General Hospital down to 1907, there was the possibility of a rheumatic connexion in 22.9 per cent. if one took into account a family or personal history of rheumatic fever, chorea, and growing pains, and regarded all cardiac bruits, of whatever nature, as due to a rheumatic carditis.

From 1907 to 1920 I made the closest inquiries and the most careful examination as to the existence of rheumatic symptoms in 50 consecutive cases of erythema nodosum seen in hospital and private practice. In this series the result is much the same—that is to say, 25 per cent. gave either a family history or a personal history of acute rheumatism, or had a cardiac bruit whilst under observation. In the majority of these cases a note was made of the fact that the bruit was probably haemic. Amongst practising physicians the view that erythema nodosum is a rheumatic disease is fast disappearing. It is kept alive only by the medical textbooks which copy the statement from one to the other.†

The question of the association of erythema nodosum and tubercle cannot be dismissed so easily. The French school led by Poncet and Landouzy, and to a lesser degree the Germans, maintain the tuberculous origin of the disease; but in this country the view more commonly held is that erythema nodosum is more likely to develop in tuberculous subjects, or that an attack of erythema nodosum (just like an attack of measles) may light up afresh a latent tuberculous focus.

In April, 1914, I published in the BRITISH MEDICAL JOURNAL an account of 6 cases of erythema nodosum associated with tuberculosis; since that date, in other 30 cases tuberculous lesions have been found in 2 only; both were cases of tuberculous glands in children. In private practice I have followed cases of erythema nodosum for four, ten, and fourteen years, and no signs of tuberculosis have arisen. I have not succeeded in exciting or re-exciting the lesions of erythema nodosum by the intradermic injection of tuberculin, nor have I found von Pirquet's reaction invariably positive in children with erythema nodosum. Inquiries made at tuberculosis sanatoriums do not show that cases of erythema nodosum are of frequent occurrence. Of especial value is the reply of Sir Henry Gauvain, medical superintendent of the Treloar Homes for Crippled Children, who writes to me: "As far as my memory serves me, I have not seen more than half a dozen cases of erythema nodosum out of 2,500 children treated here during the last twelve years."

Time will not permit me to go further into the discussion of this matter, but it is one of great interest and would well repay further investigation. I wish to confine myself strictly to discussing, "What facts are there supporting the view that erythema nodosum is a definite infective disease?"

If erythema nodosum be a specific infectious fever we should expect it to present definite epidemiological and clinical features, namely:

1. Communicability from person to person.
2. Occurrence in epidemic outbreaks.
3. A seasonal incidence.
4. A constant age incidence.
5. A definite and orderly sequence of events during the illness—for example, a period of incubation, of prodromal illness, of febrile reaction, rash, and convalescence. Relapses.
6. Conferment of immunity.
7. To a lesser extent, we should look for alterations in the leucocyte count, a fall of the blood pressure, and the presence of organisms in blood, urine, or tissues.

Some infectious diseases present those characteristics better than others. For instance, there is a wide difference between a group of diseases such as measles, scarlet fever, and chicken-pox, and a group such as influenza, anterior poliomyelitis, and encephalitis lethargica; and erythema nodosum could be classified best with the latter group.

Infectivity.

With regard to the infectivity of the disease, I have records of three instances in which two cases of erythema nodosum have occurred in the same house within three days of one another. Whilst such incidents lend support to the view that they were the result of a common infection, it might equally be true that both cases arose from some toxic source shared in common.

In 1907 I saw a boy with erythema nodosum, his sister having suffered from the same disease three weeks previously. On July 12th we discharged a boy from the Bristol General Hospital convalescent from erythema nodosum, and admitted his sister suffering from the same disease on August 31st. The rash was well developed. An interesting series of cases occurred at the Bristol General Hospital last year. Two ladies (sisters) developed the rash of erythema nodosum—one, a medical student, on March 20th, and the other on March 22nd. There can be no doubt that they were infected from some common source, for the medical student had been suffering from an attack of measles from March 3rd to March 17th, and had been separated from her sister. The medical student first returned to her hospital work about March 27th—long before her nodes had disappeared.

On April 8th a nurse in the ward in which this student was working developed pains in the limbs with fever, and the erythema nodosum rash appeared on April 12th. The night nurse of the same ward had a sore throat about April 15th, and after a period of indefinite malaise developed fever and arthritis on May 2nd and erythema

* Abstract of a Presidential address delivered before the Branch, June, 1921.

† I discussed this matter more fully in an article contributed to the *Lancet*, January 25th, 1907; and in the *Practitioner* for August, 1913, Gosse contributed a most convincing paper controverting the rheumatic view.

nodosum rash on May 8th. The interval between the date of the lady medical student's return and the first appearance of symptoms in the nurses was twelve and nineteen days. If these nurses were infected from the student, then the incubation and prodromal periods must have been very brief. I am inclined to think that the prodromal period in this disease may very occasionally be limited to one or two days only.

Multiple cases have been noted by other observers, amongst whom I may mention Lendon and Gosse. Unfortunately they do not enable us to fix with any degree of accuracy the incubation period of the disease, because erythema nodosum is frequently characterized by a long prodromal period with or without fever. This prodromal stage may last from one to three weeks before the rash appears, and is often so ill-defined that it is impossible to say when the illness began. Taking all these difficulties into account, it seems probable that the incubation period is about fourteen days.

Epidemicity.

Small outbreaks of erythema nodosum are reported from time to time in the medical papers, and tend to confirm the view that the disease is infective in character. Joynt[1] reported 9 cases of erythema nodosum which occurred amongst 300 convalescent cases of measles. His report, however, might equally well be quoted in support of the view that the disease is a general toxaemia excited by measles or other malady.

A more convincing report was that of Langford Symes,[2] physician to the Orthopaedic Hospital of Ireland. In a home of 100 young girls he saw 12 cases of erythema nodosum between May 14th and June 14th. There was no antecedent zymotic illness. The incubation period appears to have been about fourteen days.

Recently a very large outbreak of erythema nodosum has come under my notice. It has not been reported in the medical press, and I am indebted to Dr. R. E. Roberts, M.O.H. of the Mynyddislwyn Urban District Council, for the following particulars. In that urban district about 50 cases were observed during a period of five weeks in August and September, 1920. The majority occurred in a small area comprising two or three streets. There was febrile disturbance and the characteristic rash on legs, face, and neck. No case of erythema nodosum had occurred in these same streets in Dr. Roberts's recollection for fifteen years. The majority of the patients were between the ages of 12 and 20 years, and both sexes were equally affected. No two cases arose in the same house. One case, in which the rash took on the characters of erythema multiforme, was of a serious nature, but ultimately recovered.

I have plotted curves from a number of cases of erythema nodosum seen year by year in the skin department of the Bristol General Hospital from 1899 to 1914, and also from the yearly number of cases seen by me from 1908 to 1914. The number of cases seen is so small that the value of the curves is not great, but they seem to show that erythema nodosum tends to recur in epidemic form every three or four years, and both curves agree in showing an exceptionally large number of cases in 1913. Such variations are the rule in other infectious diseases, as, for instance, measles and whooping-cough.

Seasonal Incidence.

In Bristol the seasonal incidence of the disease is very constant. The second quarter of the year is the period in which the largest number of cases occur, and there is another rise of lesser degree during the last quarter. The curve somewhat resembles that of measles—a disease with which erythema nodosum is not uncommonly associated. Gosse found that in London the disease was most common in the months of March, April, and May, with a rise again in July, September, and October. Hebra, Hegler, and other Continental writers also gave April, May, and October as the months of greatest prevalence.

Age Incidence.

The age incidence is even more definite, the majority of cases occurring in the second and third decades of life, chiefly during youth and adolescence. Thus, of the cases up to 1907, 63.2 per cent. occurred during the second and third decades of life, and of cases subsequent to 1907, 65 per cent. The youngest patient was aged 3 and the oldest 63 years.

Sex Incidence.

The sex incidence of this disease is a stumbling-block to the infective theory. The disease attacks females three times as frequently as males.

Lendon says that before puberty (which he fixes at 15 years) this difference is not very obvious. My own figures support this statement, and I have confirmation of his views from Dr. Kenneth Wills, who has looked up the age and sex of 53 consecutive cases attending his skin clinic. Ten of them were males, and all of these were under 15 years; of 43 females, 22 were under 15 years. It is obvious that erythema nodosum is of rare occurrence in males after puberty.

I know of only one other infective disease in which there is a marked difference in the incidence upon the two sexes—namely, chorea. In chorea, which is a cerebral form of rheumatic fever, the incidence on girls is more than twice as great as that on boys, and, like erythema nodosum, it is rarely seen in males after the age of puberty.

Goodall and Washbourne state that in scarlet fever more females are attacked than males at all ages, and C. B. Ker says that after 10 years of age diphtheria is more common amongst females, but in neither disease is the difference very considerable.

The overwhelming preponderance of attacks in females at the higher ages is an argument against both the rheumatic and the tuberculous theories of causation. It supports the views of those who regard erythema nodosum as an evidence of general blood dyscrasia, more particularly as the highest incidence is at or about puberty.

A Definite and Orderly Sequence of Events.

The definite sequence noted clinically in erythema nodosum is much more suggestive of a specific fever than of a toxaemia due to one or more causes. The incubation period is from ten to fourteen days. (Dr. Lendon writes me that in his experience the average is about eleven days.) This is followed by a lengthened prodromal period (one to three weeks), and then by a period of fever lasting for from one to three weeks. It is generally during the first week of the fever that the characteristic rash appears. The rash is confined to the arms, legs, and head, comes out in successive crops, chiefly on the extensor surfaces, and goes through definite stages of fading and desquamation. Occasionally cases occur in which the characteristic nodes are followed or accompanied by the papules and vesicles of erythema multiforme, and this can fairly be advanced as an argument against the specific nature of the disease. Time will not permit me to discuss this theory of the relation of erythema nodosum to erythema multiforme, but I may say that one never sees greater variations in the rash than one is accustomed to see in other specific fevers, as, for instance, between that of a mild case of small-pox and that of the malignant form of the disease.

Angina is so common an early symptom as to suggest that the specific infective agent gains entry by the tonsils.

Although the malaise of the febrile period is less than in other fevers, convalescence is generally prolonged. Relapses are not uncommon, especially if the patient be allowed up too soon. Arthritis is rather more frequent than in other acute fevers, and the only distinctive sign—other than the rash—is the presence of phlyctenules in the conjunctiva.

The blood pressure is low, as in fevers generally, and there is slight leucocytosis; the average white cell count in the present series was 11,000 per c.mm. The increase is greater amongst the lymphocytes than the polymorphonuclear cells. This leucocytosis is a point in favour of a bacterial origin, but my many attempts to grow an organism from the blood, cerebro-spinal fluid, affected tissues, and from the urine, have failed, both in aerobic and anaerobic media.

Immunity.

The degree of immunity conferred by an attack of erythema nodosum is not high. In the present series of fifty cases, one patient—a girl of 18 years—stated that she had suffered from a similar attack just twelve months previously. Another patient had two well marked attacks, both when under my care, the first in 1915, and the second

in 1920. I saw the sister of this patient in a severe attack in March, 1920, and in February, 1921, she had a still more serious attack, in which some of the nodules became vesicated and ulcerated. The mother of the two girls had erythema nodosum in 1886, and her oldest daughter died in 1889 during an attack of tonsillitis and erythema nodosum with endocarditis and pericarditis. There was a strong rheumatic family history, and several members of the family had suffered from multiple attacks of scarlet fever, measles, and diphtheria, so their case might be used equally well as an argument for or against the theory of infection.

Certainly second attacks are more common in this disease than in scarlet fever, but they are not of such frequent occurrence as to support the view that the disease is a blood dyscrasia due to rheumatism, tuberculosis, or other chronic constitutional weakness. I have not heard of a person suffering from more than two attacks.

Conclusion.

I do not regard the evidence I have been able to bring forward as conclusive. The strong points in favour of the theory that erythema nodosum is an infectious fever are the proof that it may be transferred from person to person and may occur in small localized outbreaks and in epidemic waves. Equally convincing is the evidence of a definite seasonal incidence and constant age incidence. The systematic distribution of the rash, the evidence of relapses, and conferment of immunity are also favourable to this view. On the other hand, one has to explain the constant association of erythema nodosum with other diseases, such as tuberculosis, measles, and minor conditions of ill health.

The heavy incidence of the disease on girls at and about the age of puberty is difficult to explain on any ground of infection, and we also have to decide whether erythema nodosum and erythema multiforme are but two phases of the same disease, or whether they are two clear and distinct entities.

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MOUNTAIN CLIMATES IN HEALTH AND DISEASE.

BY

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THE object of this note is to set out, briefly and concisely, the principal physiological and therapeutic effects of high altitudes upon the organism. As one ascends to a higher altitude the barometric pressure falls, there is a lower tension of oxygen in the air, and at the same time there is a fall in temperature. There is also increasing dryness of the air, which becomes more marked the higher one goes. As a result of the absence of moisture in the air the radiant power of the sun increases, and this is helped by the freedom from smoke and (in winter, at any rate) from dust. During the winter, when the snow is down, the radio-active power of the sun appears to be even greater than during the summer. Much interesting information may be obtained on this subject from the classical work, *The Therapeutics of Climate*, by the late Dr. W. R. Huggard of Davos.

Upon the healthy person the general effects of altitude are as follows: The tissue changes go on more rapidly, the respirations and pulse are quickened, and the body temperature tends to be slightly higher than at sea level; one is living at a greater rate, so to speak, in the mountains. Another important point is that at sea level the normal red blood count is approximately five million corpuscles per cubic millimetre, and the percentage of haemoglobin about 90; at an altitude of, say, 5,000 ft., the blood, in order to compensate for the diminished tension of oxygen in the air, becomes richer both in red cells and in haemoglobin, the ordinary estimation of a healthy person at this altitude being seven million red cells per cubic millimetre, and about 100 per cent., or even more, of haemoglobin. The essential facts here appear to be the change in the percentage of haemoglobin, and this is directly proportional to the altitude, and thus, of course, to the diminished oxygen tension of the air. The highest percentage of haemoglobin ever recorded is, I believe, 150 per cent., which was reached by one observer at a height of 12,000 ft. There is, however, another factor to be considered in regard to the process of "acclimatization." Under the lowered pressure of a high place, and, of course, proportional to the height, the internal pressure of the body gases is altered, and is always tending to equalize with the external pressure, and until this is accommodated there is increased internal pressure, which may help in producing many of the sensations experienced at first, even at a moderate height—say, 5,000 ft. This process of acclimatization takes from a week to a fortnight to accomplish itself, however, and as a result on first going to a high altitude people often feel uncomfortable and short of breath on slight exertion, and may experience cardiac palpitations and sleeplessness, with lassitude and malaise.*

At high altitude persons breathe deeper, and there is a tendency to expand the lung more than at sea level. The vital capacity also is increased. This feature is valuable in the treatment of chronic pleurisies with adhesions, and in pulmonary disease of the fibrotic type generally; also in adenoids.

From this brief summary of the chief physiological effects of altitude, it is plain that we have here a valuable and powerful therapeutic aid, if applied with care and common sense and to the correct type of case. My remarks are based upon observations made at an average height of 5,000 ft. above sea level, which, taking it all round, appears to be the most advantageous altitude as a therapeutic agent. The modern tendency of treatment is to try to increase the reactive power of the patient, rather than to attempt a direct attack on the disease itself, and this is clearly the line of procedure to take up in such a disease as pulmonary tuberculosis, where direct attack is often impossible. Since the increased metabolism at high altitudes must tend to heighten the reactive power and power of resistance, this therapeutic agent offers the best means at present available for the treatment of pulmonary tuberculosis in properly selected cases. I will first endeavour, therefore, to sketch out the types of case most likely to benefit from a stay in the mountains, and then will enumerate certain cases which should never under any circumstances be sent there.

Healthy people may thus derive great benefit from a holiday in a mountain station, and perhaps the three weeks that many spend at Christmas time in some of the Alpine resorts give the greatest possible value, as regards a holiday, that can be obtained, especially to the hard-worked professional man.

Tuberculosis: Indications and Contraindications.

Tuberculosis is, perhaps, the condition most closely associated with mountain treatment, and it is certain that there must be some good reason for the great reputation which the mountains have won for the cure of tubercle, more especially tubercle of the lungs. First, it is clear from what has already been said, that the main general principle the physician should bear in mind when deciding whether a particular patient is a suitable type of case for a high altitude must be his reactive power. And this is where the judgement of the doctor must be carefully exercised, but the following few remarks may serve as a guide in forming an opinion.

To begin with, there is no doubt that the best type of pulmonary tuberculosis to treat in the mountains is an early case in a young or middle-aged subject, if of a good general constitution, and with sufficient resistance and vitality to react properly to the increased rate of metabolic activity which occurs at an altitude. But later cases of a chronic and partially arrested type undoubtedly do very well in the mountains, especially those in which the disease appears to have come to a standstill and the patient is "sticking"; the mountain climate seems to give this type of case just the necessary amount of stimulus or "kick" to enable him (or her) to improve.

The patients who should never be sent are those in the

* An interesting account of mountain sickness and the sensations experienced at great altitudes—for example, 8,000 to 20,000 ft.—will be found in *Travels amongst the Great Andes of the Equator*, by Edward Whymper, where the effects of very high altitudes (and consequently low pressures) are carefully analysed as regards pulse, body temperature, breathing capacity, fatigue, and general sensations, etc.

advanced third stage of the disease, emaciated by toxaemia and fever, and enfeebled by the strain of prolonged and active disease. All that the mountains do to such cases is to hasten the inevitable end; the invalid, worn out by disease and with resistance gone, cannot react to the altered conditions. Unfortunately, only too often is this kind of case sent out, generally as a sort of last hope at the patient's own wish, for treatment at a mountain resort, the tendency in England, I fear, being to keep the slighter cases at home and deny them the advantages of altitude treatment, until they are too far gone for cure. If the mountains are to do their best for a patient he should be sent as soon as the diagnosis has been definitely made.

Patients with acute inflammatory conditions, severe secondary infections, or those with large septic cavities, do not, as a rule, do well in the mountains. On the other hand, the bronchial and bronchiectatic cases often derive much benefit, the catarrh and the amount of sputum sometimes diminishing greatly. Patients who have had attacks of haemoptysis are often told that they should not go to a high altitude; this is true for those with cavities and a tendency to big haemorrhages, especially where the blood pressure is raised, but it does not at all apply to the blood spitting of early or relapsing cases of phthisis; these generally do remarkably well.

The same may be said of laryngitis. Patients with this complication are often discouraged from trying a mountain climate. Here again one must distinguish between the advanced destructive tuberculous laryngitis of the third-stage case and the ordinary and very common complication of laryngitis in the earlier stages. I have often been struck with the way in which these latter cases heal up and resolve, the whole process becoming quiescent and the patient regaining almost full strength of voice. This is especially striking in those common cases where the laryngitis is really a chronic catarrhal condition associated with the pulmonary tuberculosis, and not a true tuberculous laryngitis.

Again, it is often said of patients that "So-and-so could not possibly come to a high altitude, as he (or she) is suffering from a weak heart." In my experience, practically the only kinds of weak heart that should never be sent are cases of organic valvular disease which is extensive and not properly compensated, and cases of endocarditis which tend to be acute and are likely to relapse. The myocardial type of case may gain great benefit from a mountain climate, under careful observation. I have had many patients under my care who arrived in a most apprehensive state of mind as to whether they would be able to stand the height owing to their cardiac condition, but found in a short time, when they became acclimatized, that they were more comfortable, felt better, and could do more than they ever did at home.

I have been told over and over again by patients that they were dissuaded from trying Switzerland as a health resort because they had been told that it was much better to be cured in the country and climate in which they were ultimately going to live, and that if the cure was effected in the Swiss mountains they would have to live there always, and would relapse on returning to England. This, of course, is mere rubbish, and it is not right to discourage early cases should these patients wish to try what the Alps will do for them. By such discouraging and deterring "proverbs" many early cases, which are most suitable for the Alpine climatic treatment, and would probably gain great benefit therefrom, are prevented from coming until too late, with the result that we tend to get in Switzerland many advancing and severe second and third stage cases, which can, at the best, only hope for a "patch up"; even these often regain a certain measure of health and strength, and learn to rely upon the mountains for the winter. We see these people coming out year after year for the worst of the English months, knowing that it is during these months that the Alpine climate is at its very best.

Cases of chronic pleurisy with thickening and adhesions, and consequent poor expansion of the lungs, are likely to be much benefited, owing to the deeper breathing required by the lower tension of oxygen in the air.

Cases of surgical tuberculosis are very suitable for treatment in the mountains owing to the greater amount of sunshine and increased radio-active power of the sun, especially during the winter months.

Conditions other than tuberculosis which may be greatly benefited by the Alpine climate are anaemia, bronchitis and emphysema, asthma, and neurasthenia due to overwork or business worries. Predisposed ("subtuberculous") children are enormously improved in their health by the open air and sun treatment; in certain resorts open-air schools exist. Enlarged tonsils and adenoids in children, associated with general maldevelopment and backwardness, do very well in the Alps, as also does debility during convalescence from acute illnesses. The mountains are contraindicated when there is great general enfeeblement due to a long-standing chronic disease, and the resistance and reactive power are much reduced. Cases of uncompensated valvular heart disease should not be sent to a mountain climate, nor should those with an abnormally high blood pressure. The high mountains are also, as a rule, unsuitable for chronic kidney disease and rheumatism, especially chronic muscular rheumatism.

Heliotherapy.

For certain cases the sun is a most valuable therapeutic agent, and this is a fact which nobody who has had any experience of its effects will ever gainsay, especially as regards the treatment of localized or so-called surgical tuberculosis, and as a prophylactic in predisposed children. The high altitudes are essentially favourable for the sun cure. In low-lying places the sun has to filter through the whole thickness of the atmosphere, with its attendant moisture, smoke, dust, and micro-organisms, which form a sort of veil, preventing much of the sun's power from penetrating. In the high altitudes this is not so, and here, especially when the snow is on the ground, the sun is astonishingly powerful, even in mid-winter. Sun-bathing consists in slowly and methodically training the body to become accustomed to the direct rays of the sun; as a rule, the treatment should be commenced with the lower extremities, then extended to the legs and abdomen, and finally to the back and chest, until the whole body is inured to the effects of the sun. This tolerance is attained only by deep pigmentation of the skin. The sun appears to have the following actions: first, it exerts an analgesic effect, and pain gradually decreases and finally disappears; it also has an absorbent effect on local tuberculous lesions, such as enlarged glands, chronic peritonitis, and foci in the bones and joints; it seems also, in some way, to cause absorption of adhesions; we find movement being restored in old ankylosed joints. Cold abscesses even, if not too big, are sometimes absorbed under the sun treatment, without having to be aspirated. The general condition of the patient is improved under a course of sun baths, the muscles keep their tone and do not waste, the appetite improves, and the general vitality is much increased.

Besides tubercle, excellent results are obtained by sun treatment in cases of burns, ulcers, old wounds, chronic inflammatory conditions, fistulae, and similar lesions. The sun cure is contraindicated where the temperature tends to be over 100° F. at night. In those individuals who do not pigment it is impossible to carry out the sun cure. As a rule, the greater and deeper the pigmentation the better the result. Very fair or red-haired people do not stand the sun as well as darker types. Whilst heliotherapy is of such great value in local tuberculous or simple inflammatory conditions, it is unsuited for cases of tuberculosis of the lungs, and, in particular, must never be applied if there is any tendency to active disease. Exposure to the sun in these cases is almost certainly followed by congestion of the tuberculous foci, with consequent rise of temperature, increased sputum, probably haemoptysis, and may be the means of lighting up the whole disease. It is, however, conceivable that a modified sun treatment could be worked out in certain of the more chronic types of pulmonary tuberculosis—those which approximate to a local or surgical lesion, such as chronic pleurisies or local fibrotic patches; even then it will probably be found impossible to expose either the chest or the head to the direct rays. At an altitude where the radio-active power of the sun is so great pulmonary cases should always be warned not to sit about in the sun but always to keep in the shade, and especially guard against the direct sun upon the head or chest. Many new-comers with pulmonary lesions fall into this mistake and sit out in the sun, thinking it will do them good, and are surprised to find that the reverse is the case.

The following table shows the sort of way in which the sun treatment is begun and developed:

First day: Ten minutes on feet to ankles.
Second day: Ten minutes on legs to the knees and twenty minutes on feet to ankles.
Third day: Ten minutes on legs to the hips and twenty minutes on feet and legs to knee.
Fourth day: Ten minutes on back of legs to the hips and twenty minutes on the front of legs.
Fifth day: Ten minutes on the lower trunk and fifteen minutes each back and front of legs.
Sixth day: Increase a little the exposure of the trunk for ten minutes and twenty minutes each back and front of legs.
Seventh day: Ten minutes' exposure of the back and the rest of the body as for the sixth day.
Succeeding days: Increase gradually the amount and length of times of exposure until the whole trunk, except the head and neck, is exposed for about two and a half hours' total time.

Before deciding on any particular climate for a patient two factors must be carefully considered: the demand for tissue change made by the climate and the individual patient's power of responding to this demand. A young robust person with sound digestion, heart, etc., and with much reactive power and resistance, needs a wholly different type of climate from the elderly and feeble patient, with poor digestion, indifferent kidneys, and weak circulation. These are two extreme types, but I wish to urge the great importance of considering these points before recommending a climate, whether at a high altitude or otherwise, for any particular case. In mountain climates, where there is a demand for an increased and higher rate of metabolism, people who do best are naturally those able to respond and react to this increased call upon the constitution. Thus it is that the early cases in young and middle-aged people are those which do best in the mountains; and next in order comes the more advanced or partially arrested case, where, however, the general constitution is still good and the patient can respond satisfactorily to the demands of the mountains. The second group often derive great benefit from the extra stimulation and "flip," caused by the climatic conditions of a mountain resort.

Another important point to be thought of is the mental side of the question; patients who have to lead the sedentary quiet life necessary to the treatment of this unhappy disease will be more cheerful and in better spirits in the bright sun and clear blue skies of an Alpine climate, especially in the winter months, than in the average weather conditions prevailing at that period in our own island.

ELEVEN THOUSAND CASES OF SPINAL ANALGESIA.

BY

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DURING the past ten years I have performed 11,000 surgical operations under stovaine spinal anaesthesia. As this is probably as large a number as any individual British surgeon has done, I desire briefly to place on record my experiences. The methods which I now employ represent an evolution which gradually, during the past three or four years, crystallized itself into the following procedure:

I use a platinum needle about 2½ inches long, and not much stouter than an ordinary hypodermic needle. I prefer the patient seated, with the back arched, on the operating table, when that position is possible. I select whatever intervertebral space is indicated, and insert the needle in the middle line immediately above the lower spinous process of the space. Generally one feels and hears the penetration of the membranes, and the cerebro-spinal liquid should flow in a jet, or at least in rapid drops. I remove a quantity of fluid equal to the volume of the solution to be injected.

The solution used is made up in ampoules (furnished by the Maison Clin of Paris), containing about 7½ c.cm.; to that I add an ampoule containing ½ mm. or 1 mm. of strychnine. The full dose of 7½ c.cm. suffices for a prolonged operation (such as a double hernia, a double hydrocele, with, perhaps, a ventral hernia in addition). That dose produces complete insensibility for at least one hour, and no operation should last longer than that.

I find that this method is employed by me in 97 per cent. of all operations performed. The exceptions are made up of operations on the head and neck, for which spinal analgesia is neither easy nor efficient. Many operations on the head and neck are done under local anaesthesia, and a very small minority under chloroform or ether. Spinal analgesia I use for all abdominal operations—hysterectomy, ovariotomy, appendectomy, nephrectomy, splenectomy, liver abscess—and for thoracic operations, such as empyema, thoracostomy, necrosis of ribs or clavicle.

With regard to dosage the following figures may be taken as a rough guide; at the same time, old or feeble patients should have a little less, and children of, say, 5 or 6 years about one-third of the dose (with upward gradation according to age): Hernia (double), 7½ to 7 c.cm.; abdominal and thoracic operations, 7 c.cm.; hydrocele, 6½ c.cm.; bladder (tumours, stones), 6 c.cm.; leg (amputations, fracture setting), 6 c.cm.; rectum (haemorrhoids, fistula), 5 c.cm. Let me here say that if indications of an overdose are manifest, such as pallor, anxiety, nausea, the best treatment is 2 tablespoonfuls of brandy by the mouth and 20 cg. of camphor oil by the skin, with artificial respiration in extreme cases.

Advantages.

1. Rapidity. By the time that the patient's skin has been painted with iodine and the surgeon has put on his gloves—say, three minutes—the patient is ready.

2. No anaesthetist is necessary. For those 11,000 operations I have been my own anaesthetist.

3. Relaxation of the parts. A surgeon who relies on a general anaesthetic has no conception of the facility and simplification of procedure wherewith a splenectomy, a nephrectomy, a hernia, or even a haemorrhoids operation can be performed under spinal analgesia.

4. Absence of vomiting and of shock. Frequently a patient returned to the ward after a nephrectomy will smoke a cigarette immediately.

5. Safety from serious sequelae. In septic operations, such as gangrenous or purulent appendicitis, and in septic wounds necessitating intervention, a general anaesthetic gives rise to acetone and other forms of fatal poisoning, to heart failure, and often, I am sure, to endocarditis with dangers immediate and remote. I desire to emphasize this, for they are factors of the most serious import often unconsidered and denied by surgeons.

Disadvantages.

I know of only one real disadvantage, and that is persistent headache. I have been unable to eliminate entirely that drawback. At the same time it occurs chiefly after minor operations, such as haemorrhoids and uterine curettage, and is largely due to the fact that the patients will sit up and jump about in bed. If they will rest quietly in the recumbent position, not only is there assured absence of real headache, but the rapid and complete success of all operations is thereby enhanced.

Let me state the fancied objections in order to refute them. One is told of the horror of being awake while an operation is going on. I have never found any one worry about that during the operation. Occasionally a patient will raise objections which, as afterwards confessed, were inspired by a medical man ignorant of the technique of the procedure. Among my patients Europeans of every nationality and, above all, native Egyptians clamour for its use.

The method of spinal anaesthesia, like the administration of all anaesthetics, has to be learned; failures of all kinds diminish as experience increases. Chloroform can always be administered if the stovaine should fail. But failures will be few. In remote districts especially, it is of priceless value. With its aid I should not hesitate to remove a gangrenous appendix and so save a life, even had I no one to help me except an intelligent nurse.

In conclusion, I should be indeed ungrateful if I did not acknowledge the great help, in counsel and in deed, that I have received in strenuous hospital labours from my principal assistant and colleague, Dr. Iatrou, and from past assistants in Dr. Schlesinger and Dr. Kaim.

DURING the period 1913-1916 tuberculosis in Germany increased by 26.2 per 100,000 inhabitants in the urban population and by 16.2 in the rural population; in 1916-17 by 62.6 and 31.9 respectively; in 1917-18 by 32.7 and 16.6, and in 1918-19 by 14 and 16.1 respectively. The highest mortality was between the ages 15 and 30, then between 30 and 60, and lowest between 1 and 15.

THE ACTION OF "BAYER 205" ON TRYPANOSOMA EQUIPERDUM IN EXPERIMENTALLY INFECTED MICE.

BY

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THOUGH many drugs have been tried in the treatment of trypanosomiasis in man and animals, it is generally admitted that none of them is entirely satisfactory, although cases of the human disease have undoubtedly recovered after their prolonged use. In experimentally inoculated small animals, such as mice, it is usually possible, by means of a single dose of a drug, to bring about the disappearance of the trypanosomes from the peripheral blood, but almost invariably relapses occur in a comparatively short time and the animals die of the infection.

Haendel and Joetten[1] (1920) and Mayer and Zeiss[2] (1920) published accounts of the trypanosomicidal action of a drug which they referred to as "Bayer 205." They reached the conclusion that the preparation possessed trypanosomicidal powers on various pathogenic trypanosomes in small laboratory animals.

In small doses it cured mice, rats, guinea-pigs and rabbits infected with *T. brucei*, *T. equiperdum*, *T. equinum*, *T. gambiense* and *T. rhodesiense*. The animals which had been cured were for a considerable time immune to further inoculations. A dose of 0.00006 gram (about 0.0024 gram per kilo) would cure mice of their infections, and the animals were not reinoculable for a period of three months. Administered prophylactically before inoculation the drug prevented infection. The drug was then tried by Pfeiler[3] (1920) in natural dourine in horses. The results in 200 horses thus treated were highly successful, and it is concluded that "Bayer 205" is efficient in the treatment and prophylaxis of dourine, and that it will be found to be equally successful in the treatment of sleeping sickness and other trypanosome diseases. Miessner and Berge[4] (1920) and Ellinger[5] (1920) confirmed Pfeiler's results. In small animals the German workers employed the subcutaneous or intraperitoneal methods of injection.

Dr. C. R. Hennings gave a sample of the drug to Sir David Bruce, who handed it to me for trial. It was tested on a very virulent strain of *T. equiperdum* in mice.

The animals were inoculated intraperitoneally from another heavily infected animal. In forty-eight hours the blood showed very heavy infections, and if left untreated the animals died on this or the following day. In all cases the drug was given forty-eight hours after inoculation by the intravenous route when trypanosomes were swarming in the blood.

It was found that a dose of 0.0025 gram per kilogram of body weight would cause the trypanosomes to disappear, but that relapse occurred in about one week, the animals then dying of very heavy infections two or three days later. A dose of 0.005 gram per kilogram of body weight, however, has not been followed by any relapse during ten weeks' observation. The mice are quite healthy, and from what I know of the action of other trypanosomicidal drugs if relapse is to occur, as is practically always the case, it does so in mice within ten days. It may fairly safely be assumed that the minimal dose required to produce this apparent *sterilisans magna* in mice lies between 0.0025 and 0.005 gram per kilogram of body weight if the drug is administered intravenously.

These doses do not indicate the limit to which one can go. It is possible to give a mouse with a heavy infection as much as 0.5 gram per kilo of body weight. With this high dose there is, however, a definite and immediate reaction, and some of the animals succumb to its toxic effects within twenty-four hours. With half this dose (0.25 gram) the reaction is slight. The German workers pointed out that the ratio of the minimal therapeutic dose required to bring about a permanent cure to the maximal tolerated dose was 1 to 60, and the experiments just detailed bear this out. Employing the subcutaneous method, their maximal tolerated dose was higher than that obtained here by the intravenous method. The action of the drug is not immediate. The trypanosomes disappear gradually from the blood during the forty-eight hours following the injection. In the case of tartar emetic all trypanosomes may have disappeared in half an hour.

"Bayer 205" thus has a remarkable action on the trypanosomes, in that in every instance (over 50 mice) a single injection of a suitable dose has apparently brought about a *sterilisans magna*, and this in a dose which is considerably lower than that which can be given without killing the animals. There seems every reason to suppose that this drug, whatever may be its constitution—and this has not yet been made public—will be found to be a more efficient remedy than those hitherto used in cases of human and animal trypanosomiasis, if not in other diseases, such as kala-azar. I have tried in animals most of the remedies which have previously been employed for the treatment of trypanosome diseases, and in no case has a permanent cure been obtained with single doses. The animals have invariably relapsed and have died of their infections. Thus, in the case of sodium antimony tartrate it is necessary to give mice intravenously a dose of 0.015 gram per kilo to cause the trypanosomes to disappear in twenty-four hours, while a dose of 0.05 will kill the animal in less than two days. The toxic dose is thus barely four times as great as the therapeutic dose. If a man of 70 kilograms is to receive the same proportionate dose he should be given $0.015 \times 70 = 1.05$ grams. In practice man is rarely given as much as 0.2 gram as a single dose, and this is often followed by marked reaction. The usual dose for a man is 0.1 gram (10 c.cm. of 1 per cent. solution), which, as will be seen, is about one-tenth of that required by the calculation based on mouse dosage. In the case of neo-salvarsan and its allies 0.02 gram per kilo of body weight may be taken as the minimal therapeutic dose for mice, while a dose of 0.3 gram per kilo of body weight may be tolerated. A man of 70 kilograms should then have a dose of $0.02 \times 70 = 1.4$, but in practice he is only given about half this amount, as larger doses produce severe reactions. In the case of these drugs, however, the therapeutic dose in mice does not effect a cure, but only brings about a temporary disappearance of trypanosomes. If the minimal therapeutic dose of "Bayer 205" is 0.005 gram per kilo of body-weight for mice the corresponding dose for man would be $0.005 \times 70 = 0.35$ gram. If the doses of sodium antimony tartrate and neo-salvarsan which can be tolerated by mice and man bear any relation to the doses of "Bayer 205" which can be given to mice and man, then there is every prospect that human beings will be able to tolerate a dose of 0.35 gram or even more, which is well up to the therapeutic dose required to bring about a permanent cure in animals. The dosage of "Bayer 205" for man, however, has to be determined by direct trial, as calculations based on animal dosage are full of fallacies. It is understood that this is now being done. It is also possible that different samples of the same drug may vary in their action, and the statements made here refer, of course, only to that particular one used by me.

The claims made for this drug by the German investigators, and which have been confirmed by the results detailed above, demonstrate that in experimental animals it has a remarkable trypanosomicidal action. There can be no doubt that the drug should be given a trial in naturally occurring cases of human and animal trypanosomiasis with a view to discovering if it will have in these as definite an action as it apparently has in that produced experimentally in small animals.

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Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

GLYCOSURIA OF MALARIAL ORIGIN.

IT may be of interest to record the fact, of which I became aware at the cost of a mistaken diagnosis, that transient glycosuria may occur during a malarial paroxysm.

The patient was a man of 30, suffering from bilateral apical subacute pulmonary tuberculosis, and confined to bed with mild intermittent pyrexia, the evening temperature being from 99° to 100° F. Tubercle bacilli were present in the sputum, and the urine was free from albumin or sugar. He had been under treatment in hospital for three weeks with this condition when, at 10 o'clock one morning, I found him confused, complaining of severe headache, and with a temperature of 104.2° F. There was no history of rigor. Having in mind the possibility of meningitis I sought for further physical signs, but, apart from the above condition, the only sign suggesting meningitis was the presence of sugar in the urine. According to Frew and Garrod,[1] glycosuria occurs

[1] *Lancet*, 1913, vol. i, p. 15.

in more than a third of all cases of tuberculous meningitis, although usually during the last two days of life.

During the course of the day the temperature fell. On the second day it remained under 100° F., and there was no sugar in the urine. On the morning of the third day the temperature was 104° F. and malarial parasites were found in the blood. Sugar was no longer present. The patient was put on quinine, and although the urine was examined at intervals for some weeks afterwards, sugar never reappeared. On the only occasion when sugar was present the result of the Fehling test was confirmed by the fermentation test. It occurs to me either that this occurrence is very rare, or, as is more probable, that the urine is rarely examined for sugar during malarial paroxysms. At any rate, the standard textbooks do not refer to this occurrence.

London, W. HALLIDAY SUTHERLAND.

ADVANTAGE OF IMMEDIATE OPERATION IN PENETRATING WOUNDS OF THE ABDOMEN.

ABOUT 4.10 p.m., on October 17th, 1921, G. E. K., aged 18½, an inmate of this institution, sustained a stab wound of the abdomen by accidentally colliding with another inmate who was holding a long sharp bread-knife. When I saw him, some twelve minutes after the accident, although he was pale and in great pain his pulse was good. The wound, which was about two inches long, was situated in the left inguinal region, and through it protruded some coils of small intestine. There was a cut about three-quarters of an inch long in the transverse axis of the small intestine opening the lumen of the gut.

Dr. Newton of Feltham was immediately called to give an anaesthetic, and by 4.35 p.m.—that is to say, within half an hour of the accident—the patient was under chloroform. I sutured the intestinal wound, and on returning the bowel into the peritoneal cavity I found the deep epigastric artery bleeding freely. This was ligatured, and after sponging dry the peritoneum the abdomen was closed in the usual manner. The patient made an uneventful recovery.

It must be very rare for an injury of this nature to have received such prompt attention. I attribute the happy result to the absence of delay and to the fact that the operation was performed in a room practically adjoining that in which the accident occurred, as I cannot claim any practical experience in abdominal surgery.

ALLAN C. PEARSON, M.B., B.Ch.,
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POLYTHELIA WITH FUNCTIONING ACCESSORY NIPPLE.

THE condition of polymastia is not uncommon, and is usually regarded as an atavistic reversion. It has been said that in numerous cases an apparent hereditary influence can be traced. Williams (Baltimore), in writing of the condition, says: "One in every few hundred women has one or more accessory breasts," and Goldberger makes mention of 262 such cases. Polythelia is the rarer condition, and when it occurs the accessory nipple is usually functionless. The following case of a functioning accessory nipple seems sufficiently rare as to be worthy of record:

Mrs. D., aged 23, a primipara, first remembered noticing the accessory nipple on her breast in early childhood, and regarded it as a fleshy mole.

The accessory nipple, which is about the size of a shilling, is situated close to the left mammillary line in the inferior half of and towards the periphery of the left breast, and resembles the normal nipple in everything but size; even Montgomery's secondary areola is faithfully reproduced. There is no macroscopical evidence of a supernumerary breast. The right and left breasts are symmetrical except for the small accessory nipple, and no demarcation of the gland tissue could be distinguished by inspection or by palpation. She stated that she was confined two years ago, and that after the milk flow had become established she experienced considerable discomfort from the free secretion of milk from the accessory nipple, the doctor then attending her having dissuaded her from nursing the child.

There is no evidence of any hereditary influence. The woman is one of a family of eleven, and is the only one possessing this abnormality. It has caused her no discomfort except on the occasion mentioned.

R. DOUGLAS HOWAT,
Denholm, Hawick. L.R.C.P.and S.Edin., L.R.F.P.S.Glasg.

Reports of Societies.

MEDICAL ASPECTS OF URINARY DISEASE.

AT the meeting of the Section of Urology of the Royal Society of Medicine on October 27th Sir THOMAS HORDER delivered his address from the chair on "The medical aspects of some urinary diseases." There was no doubt whatever, he said, that many of the problems met with in urogenital diseases were of joint medical and surgical interest, requiring the combined efforts of surgeons, physicians, and workers in laboratories for their proper elucidation. Here was a field for more than one type of man and more than one kind of training. At first sight it might seem that the diagnosis and treatment of simple prostatic enlargement with its mechanical disabilities, to which their first president (the late Sir Peter Freyer) had made so valuable a contribution, was a purely surgical affair if ever there was one. No doubt in a large number of cases the medical interest was reduced to a minimum. Yet the mortality in prostatectomy even to-day was by no means negligible. Elderly patients were sometimes subject to latent diseases which were only discovered by a complete overhaul. Recently, during a routine examination of a candidate for prostatectomy, he found the case to be one of chronic lymphatic leukaemia. When sent to him the patient was short of breath, and this symptom was thought to be of cardiac origin. Treatment led to an improvement, and he stood the operation very well. Most careful surgeons liked their prostate patients to be examined methodically before a final decision was given with regard to excision. Mr. John Pardoe spoke to him recently about those cases—very grave but fortunately uncommon — in which late haemorrhage followed prostatectomy, and confessed himself puzzled as to their meaning. An obvious suggestion was that the underlying cause was sepsis, but that appeared by no means certain, and this was another problem in the elucidation of which physicians and surgeons were both concerned.

Speaking of nephrolithiasis, the president said that it was true that their studies in metabolism did not as yet give any very definite lead in the direction of preventing uratic and oxalic deposits in the kidney and renal pelvis, but at least the main principles of prevention were understood. It was fairly certain that a large number of patients were kept in a safe position with regard to the re-formation of calculi when once they had been frightened into obedience by the experience of a nephrotomy or a nephrectomy. One of the most interesting of the conjoint problems was the type of case in which calculi were known to be present, perhaps in both kidneys, but the condition was largely latent as regards pain or haematuria. In such cases it was important to assess, as nearly as possible, the future history of the patient in respect of his trouble. His renal adequacy and the question of the subinfection of the urinary tract were points needing investigation. Perhaps the large and important question of infection provided the chief meeting ground for physicians and surgeons. The fact that so-called primary infections of the urinary tract were still very largely dealt with by surgeons was a survival of the old doctrine which taught that all infections were "ascending" in nature. Practitioners were still to be found who visualized a stone in the bladder or some other gross lesion as soon as a case of acute pyelitis presented itself. It was only fair to suggest that another reason why surgeons still held a lien over many of these cases was that they had been more in the van of progress than had physicians in the matter of working out problems connected with the subject. All the same, it was in the interest of patients generally that the chief centre of interest should shift to the medical side. With regard to lavage of the pelvis of the kidney, he himself had an open mind. He did not think he had ever met with a case in which really careful and detailed management failed to cure and in which the pelvic lavage did cure.

In the brief discussion following the address Mr. THOMSON WALKER said that physician i had not always been as interested in urogenital problems as they were to-day, but he agreed that the combination of physician and surgeon was very important. Mr. FRANK KIDD said

that with regard to late haemorrhage following prostatectomy, this came on about the ninth or tenth day, and the cause appeared to be sepsis. It would be absurd to pretend that these wounds in the bladder could be kept free from sepsis, but they might learn to control the sepsis to a greater degree. The secondary haemorrhage was very alarming to the patient's friends, but not necessarily dangerous; it could easily be stopped. With regard to renal lavage, he had definitely given up trying to wash out acute cases of pyelitis, for it seemed only to make the patient worse. He had never claimed that washing out of the kidney cured the patient entirely, but he had had many cases in which obedient patients were well able to go about their work and to enjoy life. Dr. DES VOEUX thought that the general practitioner might have loomed more largely in the President's review.

Sir THOMAS HORDER, in reply, said that, with regard to renal lavage, to wash out the pelvis just to get over a temporary difficulty would not carry them very far. With regard to milk diet, while he had excluded both raw milk and boiled milk, with good results, he allowed certain valuable constituents of milk, and did not exclude cream or junket. The general practitioner had, of course, figured by implication in his remarks.

PHYSIOLOGICAL ASPECTS OF HEART PROBLEMS.

THE Hunterian Society Lecture was delivered at Sion College on October 26th by Professor E. H. STARLING, who took for his subject some heart problems, which, he said, had interested him ever since he was house-surgeon at Guy's. Although he could not pretend to have solved half the problems which were in his mind in those days, nor a quarter of those which were in his mind now, at any rate he would like to bring the discussion before a body of clinicians, because a study such as this needed for its completion the investigation at the bedside no less than in the laboratory. Disease was like one of the players in a game of chess, the other player being the organism. The moves had a wonderful number of permutations and combinations, but they could only proceed according to the rules of the game. Thus a pawn could not be moved in the same way as a bishop. All that the physiologists could do was to point out the rules, and even when these were elucidated they were still a long way from understanding the game or predicting its result.

Every organ of the body, the heart included, had a margin of perhaps 1,000 per cent.; it could be worked when occasion demanded at ten times its normal energy or capacity. But if the heart were capable of only working at five times the normal, that might be sufficient for the quiet lives which many people led. When the potential surplus dropped lower than this it was time to begin to speak of heart disease—in its broadest sense, the failure of the heart to discharge its functions. Cardiac inadequacy might mean merely a diminution of the normal margin, and the person thus affected might be able to live so sheltered a life as to carry on his work for months and years, and only under conditions of stress would the inadequacy become apparent.

The function of the heart was to pump and to maintain arterial pressure—a head of pressure sufficient to supply the various organs of the body in proportion to their needs. All the organs of the body had to go short, if necessary, except the brain, the master-tissue, which must be supplied at all costs. Until death was actually approaching the brain would always have its normal arterial pressure. At first sight it was not easy to understand how the output of the heart could be diminished and yet arterial pressure be maintained. Some clearer idea might be forthcoming if the heart were taken out of its complex relationships in the body—the nervous and circulatory systems—and were made to send blood through an arrangement of rubber tubes (such as he illustrated) which could be regulated exactly and instantly. Under these conditions the wonderful adaptability of the organ became evident. When it was given more work to do the rate of necessary chemical change was adjusted accordingly and the work was done. This adaptability of the heart was simply a function of the length of muscle fibre. Within physiological limits, the more the muscle fibre was lengthened the more strongly the heart contracted and the more energy it gave out. The tone of the heart could be measured by the amount of energy it could evoke for a given length of muscle fibre. In the athlete about to run a race, while he was still toeing the line there was a certain amount of preparation for the effort in the shape of quickened pulse-beat and respiration; and in running, the movements of the muscle immediately increased the inflow of the blood into the heart (for it must be remembered that the return of blood from the periphery was due to the muscles; every vein on account of its valve was truly a heart, but a heart with a motor power which was outside, in the muscle). In running, the heart was flooded with blood, and the output for each beat was increased, but with greater dilatation there was a certain rise of pressure on the venous side, and along with this a reflex quickening of the heart. Thus there were two factors at work: the distension gave rise to a bigger output for each beat, and, owing to this venous reflex, the beat was quickened and the heart more rapidly emptied. The output of the heart in hard exercise was increased to six, seven, or even ten times the normal. But there was a limit to this process. After a time the heart tired and became less efficient, and to do its work it had to distend still further. The limit of this distension in the healthy individual was the pericardium, and in the tired man the heart came up against the non-distensible pericardium, with resulting fatigue. In the experimental heart the pericardium could be slit, whereupon the heart would take a greater distension, but at the cost of numerous small haemorrhages in all parts of its structure.

The next thing that happened after a diminished output was a fall in arterial pressure. But at once the nervous system stepped in, requiring its blood supply, and first one and then another vascular area was cut off, until finally the main output went into the carotid arteries and only a trickle of blood through other parts of the body. The failing blood supply to the alimentary canal caused defective nutrition; to the kidneys, defective excretion; to the lungs, defective oxygenation, and all these secondary effects reacted upon the heart and worsened the condition. It would therefore be realized that the primary factor in treatment for a heart with a diminished margin was rest; also the value of oxygen was learned, and the improvement likely to be obtained, at any rate temporarily, by bleeding, this depletion of the venous system giving time for the other remedial measures to take effect. A study of the coronary circulation also enabled one to appreciate what a serious thing it was when the adaptability of the coronary arteries to increased work was prevented by an organic change in their walls. In conclusion, Professor Starling reminded his audience that he had not mentioned all the factors involved; physiologists were not in contact with ordinary cases often enough ever to deal with the subject save in its broadest and most schematic outline. In his lecture he had only tried to play elementary chess; it depended on the condition of each case to expand and refine the story of the game. It was for the clinician with his experience of one kind of game after another to say in any given case which of the players, the organism or the disease, had the strategical advantage.

In replying to a vote of thanks, proposed by Sir RUSSELL WELLS and seconded by Dr. LANGDON BROWN, Professor STARLING said that he did not need to warn the members of the Hunterian Society—as he always warned his students—of the dangers of the physiologist in medicine! The danger arose out of the fact that the method of physiology was, of course, largely analytical; the functions of the body were split up into their several parts and the conditions of each of these were studied, while the synthesis, which was much more difficult, was often forgotten. It was necessary to synthesize, taking into account not only the factors he had mentioned in that lecture, but a host of others. The physiologist in medicine played only with his pawn or his knight or his queen, whereas the clinician had got all the pieces in his hands. It was necessary for the physician to complete the work of the physiologist. While it was true that any advance of medicine on other than physiological lines would be chimerical, it must not be imagined that because they knew physiology they were aware of all the moves along all the files and ranks and diagonals of the chequered board.

ANALYSIS OF NECROPSIES.

At a meeting of the Sheffield Medico-Chirurgical Society, held on October 13th in the Medical Library of the University, Sheffield, Dr. Godfrey Carter, lecturer and examiner on forensic medicine, Sheffield University, devoted his presidential address to observations on an analysis of his last 100 *post-mortem* examinations. The analysis was as follows:

Cause of Death.	No. of Cases.	Cause of Death.	No. of Cases.
Nephritis (chronic)	18	Aspiration of food into air passages (infants)	2
Asphyxia...	17	Hydatid of liver	2
Pneumonia	12	Uraemia and convulsions ...	2
Atheroma	11	Cholecystitis	1
Phthisis (acute)	4	Papilloma of larynx	1
Aortic aneurysm (rupture)	4	Meningitis (acute)	1
Myocarditis (chronic) ...	4	Endocarditis (ulcerative) ...	1
Syphilitic aortitis (acute) ...	3	Sepsis from acute eczema (infant)	1
Endocarditis (chronic) ...	3	Rickets (acute)	1
Pyaemia	2	Ruptured duodenal and gastric ulcer...	2
Status lymphaticus	2		
Enteritis (acute)	2		
Cirrhosis of liver	2		
			100

Dr. Carter drew attention to the frequency with which pleuritic adhesions were found in cases of death from chronic nephritis—namely, 39 per cent. When there was an absence of any signs of old-standing general peritonitis the association of chronic perihepatitis, perisplenitis, and perinephritis, usually spelt one of two things, syphilis or Bright's disease. The large total of deaths from asphyxia represented in great part cases of so-called overlying of infants, and therefore deaths which should not have occurred. Attention was drawn to the advisability of the careful examination of the coronary arteries in all cases beyond middle age; the atheromatous narrowing of the lumen of the vessels was most frequently found about half an inch beyond the origin in the aorta and therefore invisible from that point. After detailing at some length the technique of *post-mortem* examinations, special attention was paid to the widespread disease of the lymphatic tissues of the body which exists in all cases in which death from "status lymphaticus" can fairly be said to have occurred.

Definition of "Live Birth."

But it was to the unsatisfactory nature of the legal definition of "live birth" that the especial attention of the society was directed. A medical man could not have a more disappointing type of case to deal with than one that involved the giving of evidence in a case of the murder of a newly born child. The crux of the whole matter lay in the legal interpretation of the phrase "live birth." Judges had come to accept the ruling that to constitute "live birth," every portion of the child must have been clear of the mother's parts when the alleged violence was inflicted upon it. These murders of unwanted children were not carried out in the presence of witnesses, they were done in secret; therefore how could a medical man go into the witness box and swear that, when such an injury as was found in some particular case was inflicted, every portion of the child was fully delivered? It might be urged that the child was full term and healthy, that respiration had been fully established, that no natural cause of death existed, and only violence was found, but it was no use. "You are up against a brick wall forensically, and must abandon the quest. The charge is therefore almost invariably reduced to one of concealment of birth, and a light punishment inflicted. The English law presupposes that in criminal charges every child is born dead unless proof be forthcoming to the contrary." Dr. Carter asked if the converse should not hold good, "that every full-term child is presumed to be born alive unless proof be forthcoming that it was not." The Scottish law already took that view, although requiring evidence of the establishment of respiration. But that surely was unnecessary, as even the English law admitted that a twitch of a muscle, the flicker of an eyelid, or the detection of a heart beat, without respiration, established live birth once the child be fully extruded. An alteration of the law was urgently required in the interests of the State, and Dr. Carter suggested that the law should enact "that a child delivered at full term, and found upon medical examination to be healthy and free from any ascertainable cause of natural death, should be deemed to have been born alive failing proof to the contrary."

The first meeting of the new session of the West Kent Medico-Chirurgical Society was held at the Miller General Hospital, Greenwich, on October 14th. Dr. C. T. T. Comber was elected President, and mentioned, on taking the chair, that the society was the oldest local medical society in London, being instituted in October, 1856. Mr. Cecil A. Joll showed a patient of 79 from whom he had removed part of the stomach, also a case in which he had removed half of the tongue for carcinoma. Dr. H. Nockolds showed a patient with bony tumours all over the body, which had been present since childhood. Dr. Montague Hine showed two cases of glaucoma, a case of complete ophthalmoplegia, and an injury to the retina caused by shrapnel wound of the cheek. Mr. Hugh Davies showed part of a stomach removed from an old lady aged 75, very similar to the case of Mr. Joll. Dr. E. P. Cumberbatch showed a patient from whom he had removed a bony growth of the heel by caustic potash and ionization.

A meeting of the South-Western Ophthalmological Society was held on October 24th at the Bristol Eye Hospital. After an exhibition of interesting cases Mr. Ransom Pickard opened a discussion on the development of normal and abnormal disc cups, drawing particular attention to the need for systematic record of the dimensions of the disc cup in a form available for future reference and comparison in the event of subsequent morbid developments within the eye, and he brought forward a method of charting these data. After the meeting the members dined together at the Grand Hotel. An invitation to meet the Midland Ophthalmological Society next April in Birmingham was received from its president, Mr. Bernard Cridland, and accepted.

Reviews.

THE SPLEEN.

Sir Berkeley Moynihan has rarely touched a subject without conferring some elements of distinction upon it. In his work on abdominal surgery he has always endeavoured to widen the outlook, to make us see further than the diseased appendix or duodenum, to search for some underlying cause. In his book on *The Spleen*,[1] which contains the material upon which the Bradshaw Lecture he delivered before the Royal College of Surgeons of England last year was based, Sir Berkeley Moynihan casts his eyes upon those last strongholds of the physician within the abdomen—the spleen and the cirrhotic liver. It is not surprising to find him travelling from the spleen to the liver, impressed by the fact that the whole of the splenic venous blood passes through the liver. It is possible that this should lead us to look for the cause of cirrhosis and other hepatic disorders in the spleen. It is equally possible that the spleen merely transmits—with but little alteration, if any—poisons formed in other parts of the body. But the former view opens an interesting vista on the inter-relationships of the spleen and liver.

Chapter XIII of this book is dedicated to this discussion, and should be closely read by all surgeons who deal frequently with diseases of the biliary passages. It may be that what is actually known of splenic disease, particularly of primary splenic disease, is insufficient to pad out a pamphlet, still less a book. Sir Berkeley Moynihan has made this slim volume an airing ground for what experimental knowledge we have gained. The chief fault of the work is the absence of a definite central theme, and this makes the book difficult at times to read. On the other hand, nothing but good can come of the statement given here of the inter-relationships of the haemopoietic and other systems. If not a new subject, the spleen has kept her secrets closely guarded, and is not likely to give them up at once. Too much attention has been paid to the spleen alone, in isolation, and the very happy diagrams with which this book is illustrated broaden the outlook. It is probable that many will disagree with some of the statements here made, and the discussion and criticism of the points raised will be all for good. The author relies largely on the results of operation at the Mayo clinic, and makes but passing reference to cases of his own. The

[1] *The Spleen and some of its Diseases.* By Sir Berkeley Moynihan. Bristol: John Wright and Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent and Co., Ltd. 1921. (Sup. roy. 8vo, pp. 139; 13 plates. 21s. net.)

technique of splenectomy is not described, and, after all, would be out of place in a book of this kind, which is rather a provocative essay than a textbook of splenic medicine and surgery.

A DICTIONARY OF PRACTICAL MEDICINE.

MEDICAL practitioners will be grateful for the appearance of the large three-volume *Dictionary of Practical Medicine*,[2] edited by Sir MALCOLM MORRIS, who originated the work and charges himself with the subject of dermatology, Professor LANGMEAD, and Dr. GORDON HOLMES who is responsible for the sections on neurology. The editors have enlisted as contributors to the *Dictionary* over 120 physicians, surgeons, and specialists already well known in Great Britain as writers on the subjects with which they deal, most of them living within the London area.

The headings in the *Dictionary* consist of the names of diseases, symptoms, and special methods of treatment or diagnosis, for the most part, and seem sufficiently complete to fulfil all the requirements of the practitioner. Perusal of the articles themselves shows that while etiology and pathology as a rule receive adequate but short exposition, the greatest amount of space is devoted to such practical things as symptoms, diagnosis, prognosis, and treatment. The chief subjects omitted by the editors for want of space are those of fractures, dislocations, and labour; minor operations are described with needful detail, but major operations, barring their indications, have been left out. The subject of tropical medicine is fully dealt with, a fact that will be found to add considerably to the value of these volumes now that the facilities for travel abroad have made the occurrence of tropical diseases in Great Britain not uncommon. Forensic medicine receives due attention in all three volumes; and, while it is perhaps invidious to mention special articles by name when dealing with a work showing so high a standard of excellence as this, those on the use of *x* rays in diagnosis, on tuberculosis from the standpoint of preventive medicine, on the examination of the eye, on poisons and poisoning, and on immunity, to mention but a few out of many, will be found of the greatest practical interest.

The *Dictionary* is well turned out, and contains a number of excellent figures and coloured plates. It is, as it professes to be, a thoroughly practical work, and it should be of great service to the general practitioner of medicine, to whom it may be cordially recommended.

UROLOGY.

THE tenth and eleventh volumes of the *Transactions of the American Urological Association*[3] contain much of more than passing interest. The American Urological Association was formed in 1902, and has grown steadily since, so that at the present date it counts amongst its members all the best known genito-urinary surgeons. Whilst the general level of the contributions is undoubtedly high, it must be confessed that a few of the papers included might well have been dispensed with. However, in a publication such as this it is but natural that the value of the different contributions should vary considerably.

Amongst the most interesting articles in Volume XI are those contributed by Alexander Randall and by Hugh H. Young and H. L. Cecil on the symptoms, pathology, and treatment of median bars of the prostate. Randall gives an accurate account of the condition of the prostate in some 300 autopsies. As he justly remarks, the term median prostatic bar is very vague, and includes a number of different conditions. He has definitely divided such cases into four types. The first consists of an "abrupt bar or dam stretched across the posterior lip of the vesicle orifice. It is formed of dense sclerotic tissue whose edge is sharp and narrow, and whose lateral terminations form an abrupt angle with the lateral walls of the vesicle outlet." The microscopic section of this type has shown that it is of the nature of an inflammatory sclerosis. In the author's opinion the fibrous type of median bar is "the outward visible sign of an underlying infective process, a chronic prostatitis." The second type is also fibrous in nature, but the bar has a tendency to project upwards towards the bladder, encroaching upon the vesical trigone rather than on the urethral surface. The microscopic appearance of this sub-variety of fibrous bar is similar to that of the first type. The third type is definitely glandular in nature, the hypertrophy being confined to the gland acini of the posterior prostatic commissure. It raises the posterior vesicle lip into a thick, broad, heavy obstructing bar. It is undoubtedly prostatic in origin. The fourth type is also glandular, and is caused by the isolated hypertrophy of Albarran's subcervical glands. This type rarely develops as a definite bar, but rather as a rounded lobe with deep lateral clefts. The microscopic section shows a proliferation of gland acini. Age has not been a differentiating point in any series or type. The youngest of the cases classified as bars of the fibrous type was 55 years of age and the oldest 79. In the glandular types the youngest was 46 and the oldest 73.

Drs. Young and Cecil's article furnishes an analysis of 156 cases of prostatic obstruction of the bar variety treated by the punch operation, and forms a useful addendum to the preceding contribution. They claim for the operation that it is without mortality, that it has been attended by no serious complications, and that convalescence is shorter than with any other. The results they have obtained make it the ideal operation for obstruction of the prostatic orifice not associated with prostatic hypertrophy. It must be used with great discretion, and a careful examination made of the prostate to ensure that obstruction is due to the existence of a prostatic bar, and not to the presence of general enlargement.

Dr. Irving Simons reports favourably on renal lavage as a treatment for pyelitis. After noting that the results obtained do not appear to be dependent upon the solution used for lavage, the author decides in preference of strong solutions of silver nitrate up to as high as 2½ per cent. At the conclusion of his article he gives an excellent bibliography dealing with pyelitis and its treatment.

In Volume X Gilbert Thomas contributes an interesting paper, illustrated by radiograms, on bladder diverticula. In discussing the etiology of the conditions, he arrives at the conclusion that acquired factors are necessary for the development of diverticula of sufficient importance to give rise to clinical symptoms. The commonest factor was obstruction; it occurred in 86 per cent. of his cases. The average age of onset was 43 years. Surgery is the best method of treatment, the choice of operation depending on the location and size of the diverticulum. When resection is possible the mortality is almost negligible. In complicated cases the mortality is higher on account of the danger of renal and vesical infections.

Dr. F. R. Charlton describes as a distinct clinical entity a condition found in old women, which he terms "cystitis senilis feminarum." He correlates the condition with similar degenerative age changes found in other mucous membranes, such as the conjunctiva. The cystoscopic appearance varies, but frequently has the character of a bullous oedema. He regards pure liquid guaiacol given internally as a remedy almost specific in its action.

Dr. Thomas discusses vaso-puncture and instillations of 5 per cent. collargol into the vesicle as a method of dealing with chronic vesiculitis. Vaso-puncture, in his opinion, offers an important aid to the treatment of vesiculitis; in his experience 40 per cent. of cases have been cured by this proceeding and 50 per cent. definitely improved.

The volume concludes with an excellent series of articles on the subject of tuberculosis, contributed by J. H. Cunningham, George Dock, Edward L. Young, W. E. Lower, and H. L. Kretschmer. These articles cover a great deal of ground and deal with every aspect of the subject. Taken together, they furnish an excellent epitome of the attitude of American urologists towards the interesting and difficult subject of the treatment of genito-urinary tuberculosis.

[2] *The Dictionary of Practical Medicine.* In three volumes. Edited by Sir M. Morris, K.C.V.O., F. Langmead, M.D., F.R.C.P.Lond., and G. M. Holmes, C.M.G., C.B.E., M.D.Dubl., F.R.C.P.Lond. Vol. i, Abderhalden Reaction to Headache. Vol. ii, Head Injuries to Pregnancy, Molar. Vol. iii, Pregnancy, Pernicious Vomiting of, to Zona. London and New York: Cassell and Co., Ltd. 1921. (Cr. 4to. Vol. i, pp. xv + 587; 30 figures, 12 plates. Vol. ii, pp. viii + 623; 53 figures, 12 plates. Vol. iii, pp. vii + 532; 26 figures, 22 plates. £5 5s. per set.)

[3] *Transactions of the American Urological Association.* Fifteenth Annual Meeting, St. Louis, Missouri. Vol. x. Pp. 298; and Sixteenth Annual Meeting, Chicago, Illinois. Vol. xi. Pp. 383. Brookline, Mass.: Riverdale Press. (Med. 8vo; illustrated.)

LOCAL ANAESTHESIA IN DENTAL SURGERY.

MR. NORMAN BLACK, of Dundee, has put into *Local Anaesthesia*[4] the gist of some lectures delivered by him to dental students of the University of St. Andrews. He deals with both the theory and practical application of what is known on the subject of local anaesthesia in relation to dental surgery, and puts his points very clearly. Briefly summed up, his view would appear to be that when used with full knowledge and a reasonable amount of manipulative skill the induction of local anaesthesia is to be regarded as the method of choice, general anaesthesia being in the case of most if not all dental operations a relatively clumsy means of producing the desired result—which is the avoidance of pain. All methods of producing local anaesthesia receive attention in this book, but naturally the considerations attaching to the use of anaesthetics of the cocaine order occupy much the greater part of it. The author is notably fair in his review of the claims of different drugs of this class, but the reader will be disposed to conclude that in his own work he chiefly uses freshly prepared sterile solutions (about 0.8 per cent.) of cocaine, minimizing their escape into the general circulation by the addition of adrenaline, injecting them very slowly and exactly at the spot where they will most easily reach the nerve ends that it is desired to stun, and observing throughout the strictest attention to the rules by which in general surgery asepsis is obtained. All these points are considered in detail, as also the right use and right occasion for local infiltration, submucous anaesthesia, and regional anaesthesia respectively; and chapters are added on the treatment of toxic effects, and post-operative sequelae should either of these troubles ever be encountered.

The book, in short, is thoroughly practical and its due comprehension is facilitated by about a dozen wood blocks and reproductions of photographs. It may therefore be commended to all those who ever have to perform any of the operations of dentistry.

A TEXTBOOK OF BOTANY.

PROFESSOR SMALL'S *Textbook of Botany*[5] for medical and pharmaceutical students provides a full and first-rate account of the elements of the subject, taking the term "elements" in its widest sense. The book is full of detail, but the detail is not crowded, and the text gains much from the freedom with which it is illustrated. The book is divided into two parts: the first of these covers over 400 pages, and is divided into thirty chapters on the various parts of plants and on the functions discharged thereby. Part II deals with the classification of plants, and gives an account of the different divisions or phyla and their main characters. The book ends with three short appendices included for the benefit of pharmacists and an unusually full index. Professor Small writes clearly and dogmatically, and has exercised a wise choice in treating much of his subject with a greater breadth and fullness than is called for by the syllabuses of the examinations that have to be passed by his readers. We could wish that the words "chemosynthesis," "chemotaxis," and "chemotropism" were spelt "chemio-" rather than "chemo-" in this volume; it is true that Pfeiffer first used the spelling "chemotaxis" when he invented the term, but it is also true that he presently amended it to "chemiotaxis." The prefix "chemo" properly implies "swelling," as in the word "chemosis"; the word "chemistry" is derived from the Greek χημεία, and the root of χημεία is "chemi-," not "chemo-." We can strongly recommend this volume to all readers in search of an elementary textbook of botany.

NOTES ON BOOKS.

UNDER the title of *Medical Electricity for Students*,[6] Miss BROWNE, a teacher at the Western Infirmary, Glasgow, presents a textbook intended for the use of students preparing for the examination in medical electricity of the Chartered Society of Massage and Medical Gymnastics, and has been made to keep within the limits of the syllabus of this examination. The subject is discussed in three main divisions: (1) Electricity and magnetism; (2) medical apparatus; (3) electrical treatment. In the first the general principles of electricity are dealt with in simple language, magnetism and electro-magnetic induction are explained, and the section concludes with a comparison of different electrical currents. In the second part the various instruments, batteries, switchboards, earth-free apparatus, and many accessories are illustrated and their structure made clear. The final part discusses the effects of electricity upon the body, ionic medication and its application, radiant heat and light, and static electricity, and concludes with a chapter on diseases and treatment. A syllabus of what is required for the examination of the Chartered Society and copies of a few of the examination papers on medical electricity are added. The author has succeeded in writing a book which should serve the purpose of the students for whom it is intended, and be useful also as a textbook for a beginner in this work. The illustrations and diagrams are well chosen and a considerable help to the text, and the general arrangement is good.

Dr. J. C. THRESH'S *Domestic and Personal Hygiene*,[7] one of the useful little books issued with the stamp of the St. John Ambulance Association, provides the general reader with an up-to-date account of the relation of dirt to disease, and gives instruction in the gospel of cleanliness as applied to the house and the person. The book is practical and should enjoy a wide popularity. It is arranged according to the revised syllabus of the St. John Ambulance Association.

The chief feature of Dr. FANTOZZI'S essay on haemorrhages due to gunshot wounds in war[8] is the extensive use made of the literature dealing with this well-worn subject. His bibliography extends over 116 large pages, and his text bristles with the names of the authorities he quotes. The book should be of service to those interested in the history and treatment of haemorrhages in general.

KÜHNEMANN'S differential diagnosis of internal diseases, stated on its title-page[9] to be in its sixth and seventh editions simultaneously, gives a compressed and often tabular account of the symptoms and physical signs met with in internal diseases. Given the disorder from which a patient is suffering, the medical man can here find the physical signs that should be present. The book contains a great deal of information which appears to be up to date.

[4] *Local Anaesthesia: Its Theory and Practice in Dental Surgery.* A Handbook for Practitioners and Students. By N. Black, L.D.S.Eng. London: J. Bale, Sons, and Danielsson, Ltd. 1921. (Cr. 8vo, pp. 73; 10 illustrations. 5s. net.)

[5] *A Textbook of Botany for Medical and Pharmaceutical Students.* By J. Small, D.Sc.Lond., Ph.C., F.L.S. London: J. and A. Churchill. 1921. (Demy 8vo, pp. 688; 1,350 figures. 25s. net.)

[6] *Medical Electricity for Students.* By A. R. I. Browne. Oxford Medical Publications. London: H. Frowde, and Hodder and Stoughton. 1921. (Cr. 8vo, pp. 245; 82 figures. 12s. 6d. net.)

[7] *Domestic and Personal Hygiene, or the Gospel of Cleanliness.* By J. C. Thresh, M.D., D.Sc. London: St. John's Gate, Clerkenwell, E.C.1. 1920. (Demy 16mo, pp. 266; 27 figures. 2s. 6d. net; by post, 2s. 8½d.)

[8] *Le Emorragie nelle ferite d'arma da fuoco in Guerra.* Dott. G. Fantozzi. Pescia: Benedetti and Niccolai. 1920. (6½ × 9½, pp. cxvi + 385.)

[9] *Differential-Diagnostik der Inneren Krankheiten.* Von Dr. G. Kühnemann. Sixth and seventh editions. Leipzig: J. B. Barth. 1921. (Med. 8vo, pp. 250. M. 25.)

APPLIANCES AND PREPARATIONS.

Some Test Preparations.

SOME recent preparations produced and supplied by Burroughs, Wellcome and Co. at their Physiological Research Laboratories are: (1) the Wellcome brand of diphtheria toxin for performing the Schick test to determine whether an individual is susceptible or immune to diphtheria; (2) the Wellcome brand of diphtheria prophylactic toxin-antitoxin mixture for active immunization; and (3) the Wellcome brand of Sachs-Georgi antigen, a modification of that recommended by Sachs and Georgi for the diagnosis of syphilis.

A Modified Midwifery Forceps.

DR. L. E. GREEN DE WOOLFSON (Birmingham) writes: To avoid the delay, difficulty, and trouble of putting a patient in position over the edge of the bed, so as to introduce the upper blade of forceps, I had a set made for me by Messrs. Phillips, Harris, and Co., Ltd., of Edmund Street, Birmingham, with shortened shafts between the blade and lock, and with the handle of the upper blade to unscrew below the wing. These forceps can be used easily with the patient in any part of the bed.

An Improved Surgical Needle.

MR. C. HAMILTON WHITEFORD (Plymouth) writes: Many surgeons will recognize an old acquaintance in the needle, with hollow end and single thread, described by Mr. H. S. Souttar in the BRITISH MEDICAL JOURNAL of July 30th. The periodical resurrection of this form of needle appears to be based on the theory that the ordinary sewing needle with its doubled thread catches badly in the tissues, and that sutures, inserted by the usual method in the walls of hollow viscera, are likely to cause leakage. Clinical experience has proved the "catch" to be negligible and the risk of leakage imaginary.

MOTOR NOTES FOR MEDICAL MEN.

By H. MASSAC BUIST.

THE DOCTORS' MOTOR SHOW.

For the first time since the outbreak of war it may be written that a motor show for medical men is being held in London. The exhibition opened yesterday at Olympia, Kensington, and the White City, Shepherd's Bush, by the Society of Motor Manufacturers and Traders under the patronage of the King, reveals complete reversion of policy on the part of the world's motor car manufacturers. Instead of striving to discover how costly they can design their machines, practically all the leading houses in the world have devoted their enterprise to the production of moderate priced cars. Some have actually developed their schemes to include vehicles of sensationally low price, yet of sound design and construction. There is no longer any need for the young doctor to put up with a motor bicycle and side-car; the long-looked-for link vehicle between the motor cycle and the car has arrived in the guise of the 8-h.p. twin-cylinder Rover car, which I prophesied two years ago would be developed to this stage. It is now introduced at the rock-bottom price of £220—which has been arrived at by estimated reductions in the cost of labour as well as the new scale of raw material prices—as a vehicle developed in the light of experience in the hands of users. It is very much better than any previous example of the type that was introduced two years ago at £350, put on the market at the last show at £300, reduced late in the summer to 250 guineas, further reduced this autumn to 230 guineas, and now brought down to £220. If other firms could do anything like as much in the way of cutting costs we should be well on the road to creating a big demand for new style motoring. But the problem is so intricate that very few members of the industry have the brains, the daring, and the resources to solve it. The essence of the thing is never to lose sight of the fact that the public is ever demanding a better vehicle. That this achievement is possible may be illustrated briefly by pointing out that the new body fitted to the 8-h.p. Rover model has curved panels more on the lines of those on the 12-h.p. four-cylinder type. This new 8-h.p. body is stronger than the one it supersedes. The cushions are better sprung. To allow more room for getting out when the hood is up, the running boards have been fitted nearer the ground, and valances have been furnished to improve the appearance. The hood is also better, alike in regard to detail and finish. The steering wheel has been covered with celluloid, making it warmer and more comfortable to the hand.

Access may now be had to the magneto without moving the bonnet or radiator. The boot at the back of the car has been made deeper, and the spare wheel is fitted to the side of the car. A mud shield is furnished on the front axle, serving to keep all mud and dirt off the engine. The silencers have been improved and strengthened. In regard to mechanical features, valve clearance gauges are now supplied in all tool kits. These clearances being very important, it will be appreciated that it is a great advantage to have gauges whereby adjustment can be checked and, if necessary, effected quickly and with exactitude. Oil and petrol strainers are now fitted in suitable positions. In short, we are dealing with both a proved and an improved proposition, as well as one supplied complete at a sensationally reduced price, yet selling at a profit—a point which it is necessary to stress in that at this period so much material is on the motor market which is out of date in design; whereas Rover plans for creating the era of cheap motoring by car are only beginning to ripen.

THE VOGUE OF QUARTER-ELLIPTIC AND OF CANTILEVER SUSPENSION.

We could not call this a cycle-car proposition. Its outstanding merit is that it is a motor car proper with refinements, complete body work, quarter-elliptic suspension fore and aft, a single-plate clutch—such as is used now even on the luxurious 12-cylinder Fiat car—a gearbox giving three speeds forward, and a worm-driven back axle. The development is interesting not merely as a text for illustrating motor progress of service to medical men, but also because it has had a tremendous effect on the 1922 programme of the industry in general. The idea of using four quarter elliptic springs in such a manner as to make the weight of all the springs themselves sprung weight was not originated by the Rover Company. It was exploited by Vickers in the Stellite car designed in the pre-war days by the Wolseley Company, which has in turn developed that principle into the post-war series of four-cylinder Wolseley cars. It is widely copied to-day, without, however, the use of the safety plate, which is the distinguishing Wolseley principle, though I note that the new small 8-h.p. Standard car is specified as employing the safety-plate scheme. The great point about this form of suspension is that it makes for economy as well as luxury, because it keeps the tyres on the ground, therefore they are not scraped away. On the other hand, it is impossible to get a jar, though the car may plunge if the road surface is very bad. All the firms associated with racing held hitherto that it was quite an impossible suspension for the larger sorts of cars. The successful introduction of the 15-h.p. Wolseley car, a refined, high-grade vehicle capable of accommodating all sorts of coachwork, has proved this contention to be absolutely wrong as far as standard vehicle practice for road service is concerned. I have driven such a car on bad surfaces in Cornwall at 53½ miles an hour, and it held the road well. On the other hand, of course, any firm attempting to race with that particular design of springing against competitors of equal efficiency using hard, half-elliptic springs, would be at a disadvantage. This indeed clearly illustrates one of the features in which we do not learn lessons from racing, though it nevertheless enables us to evolve valuable other features for standard cars. Suffice it to point out, among significant developments at this period, that a firm associated with racing so prominently as Darracq, whose chief designer is now Mr. Louis Coatalen, still of the Sunbeam Company, introduces an 8-h.p. four-cylinder overhead-valve engine small car with quarter-elliptic springs fore and aft, a model which is also to be made to the same design by Talbot. Moreover, a 10-h.p. Wolseley has beaten any car of equal engine size by doing three hours at 78.30 m.p.h. at Brooklands; and also by travelling 250 miles there at 78.67 m.p.h. with Blic ignition.

BEATING DOWN THE BARRIERS OF PREJUDICE.

The first Talbot of that type was taken by Mr. Malcolm Campbell, the racing driver, for a test at Brooklands. The 7-cwt. chassis was found to ride quite comfortably on that very solid surface at 56½ miles an hour with the engine quite indifferently tuned up because there was no question of racing against competitors. It was merely a matter of the manufacturers satisfying themselves how the type of chassis rode. The driver was astonished at the ease of riding furnished. There was never a jar. The incident is interesting as showing that now we have awakened folk of racing experience to the advantages of this particular form of design for standard car work, just as, at last, we have got the Continental manufacturers in general, and a number of firms hitherto prominently associated with racing in this country, to take to the full cantilever spring for the rear suspension of the larger classes of vehicle, as instance the current Hotchkiss, Berliet, Renault, Panhard, and other Continental models, and the new 14-h.p. Sunbeam, the new 14-h.p. Vauxhall, the new 14-h.p. Talbot, and the new 12-h.p. 1½ litre Talbot-Darracq. The use of quarter-elliptic springs fore and aft at this stage by other than firms making small cars is not advisable in that nobody else has spent the time and the money on investigation that has enabled the Wolseley to evolve this form of suspension as an entirely specialized device suitable in their practice for middle-size cars as well, as is proved beyond question in the case of their 15-h.p. vehicle.

A big movement to be observed this year is the introduction by some of the largest houses of small cars with quarter-elliptic suspension fore and aft, as instance notably, in addition to the established 10-h.p. four-cylinder overhead valve Wolseley and 8-h.p. two-cylinder Rover, the bringing forward of an 8-h.p. four-cylinder, overhead valve, water-cooled Standard car with this form of suspension; the already mentioned 8-h.p. four-cylinder overhead valve Talbot-Darracq and Talbot types; the B.S.A. 90-degree twin-engined, air-cooled model; the Belsize-Bradshaw twin-engined air-*cum*-oil-cooled car; and the new G.W.K., among many others that might be cited. In some cases,

such as the last named, the rear pair of springs are set at a tangent in relation to the side members of the frame, the idea being to damp out rolling tendencies. In the Wolseley system, which is the most highly developed of all, some of the patents employed damp out rolling tendency despite the fact that the springs are parallel with the side members of the frame. Of course, one of the difficulties of copying a development of this sort is the fact that the builder has to go warily or he will find himself falling foul of the pioneer's patents.

"The Battle of the Cylinders" starts afresh.

Inasmuch as the outstanding novelties of the Paris show were dealt with in the JOURNAL of October 15th (p. 611 et seq.), this is not the occasion to touch on those matters afresh, save to point out that the most important of these novelties are to be seen at Kensington to-day; in this connexion particular attention should be paid to the new small Panhard, Delaunay-Belleville, Chenard-Walcker, Renault, Delahaye, Delage, Voisin, Ballot, Minerva, Citroen, Bugatti, Vinot, Zedel, Salmson, and such-like types. A study of the chassis details of these vehicles will particularly repay attention. Nor must one overlook the types standardized for a year or more but now brought forward at much lower prices, as instance, notably, the post-war-designed 10-h.p. and 15-h.p. Fiat from Italy. I am, of course, dealing with middle and small-size vehicles, in which connexion it will be observed that the average Continental constructors use the four-cylinder water-cooled engine, which is even employed for the 5-h.p. Citreon and the new 7-h.p. Mathis, which latter will, I am afraid, not be shown at Olympia. At least, that was the situation at the time of going to press. By contrast, in this country, owing to the great success achieved by the air-cooled Rover, it will be seen that a large number of makers, including B.S.A., Belsize, Short (the aeroplane builders) Ashby, and so on, are using the air-cooled engine and are reverting to the two-cylinder type, of which we find examples in, among others, the horizontal, flat, opposed, 7-h.p., water-cooled, side-valve engine Wolseley, which is another novelty. Apparently many constructors imagine that the only possible way "to go after the Rover market," as the trade styles it, is to have some form of two-cylinder engine. It can be made with a much better balance than when it was designed as a horizontal type in the very early days. For example, the 90 degrees and 60 degrees can be designed to give quite a good balance; and the horizontally opposed type has really an excellent balance. But the surprise sprung on the exponents of these schemes by other members of the British industry has been reserved until the last moment and is something in the nature of a dramatic coup—as instance, the introduction of the miniature four-cylinder engine with overhead valves of the 8-h.p. rating by Standard, Talbot-Darracq, and Talbot.

The Campaign of Price Reduction.

Of course it is impossible on the mere ground of costs for these vehicles to rival the air-cooled Rover. But the astonishing point is that they run at least neck and neck with the average of other two-cylinder cars on the market. Some of the Continental four-cylinder overhead valve types will be sold in this country at prices that will certainly compete. For example, the price of the B.S.A. two-cylinder air-cooled overhead valve Hotchkiss engine car is £340, whereas the Talbot-Darracq four-cylinder overhead valve water-cooled proposition is £325. The former engine gives about 18-b.h.p. at 2,600 r.p.m., and the latter 20-h.p. on the break, it being set in a chassis that weighs 7 cwt. These last-moment developments—the Talbot-Darracq was not announced until just before the opening of the show—are confirmation of the forecast I made when last writing on the subject to the effect that the two-cylinder air-cooled engine's chief sphere is that, wherein it is possible to produce it to sell cheaper than any rival product with four cylinders, whether air- or water-cooled, or with side or overhead valves It is only necessary to consider the prices of the Belsize-Bradshaw £275, Crouch £285, B.S.A. £340, two-cylinder side-valve water-cooled Wolseley £310, and so on, to realize that the more expensive types of two-cylinder engines do not constitute serious rivals, on the grounds of price, to the cheaper four-cylinder vertical engine propositions, such as the 8-h.p. Standard £325 and the 8-h.p. Talbot-Darracq £325. On the other hand, neither the Talbot-Darracq nor the Standard compete with the Rover at £220. It must be had in mind that for every 10 per cent. that can be taken off the price of a vehicle between the £200 and £350 range, the public to which it appeals is multiplied manyfold. It appears that most of the designers of new style two-cylinder vehicles had no notion, on the one hand, of what large saving it is possible to effect in cost when, the period of experimenting being over, orders can be placed for raw materials in vast quantities, as for the 8-h.p. air-cooled Rover car, and, on the other, at what low prices certain firms are able to produce four-cylinder water-cooled engine vehicles. In addition to British enterprise in the latter direction, we must note the Continental work of Bugatti, Mathis, Peugeot, and Citroen.

The first message this show has for the medical man is that there is no need for him to indulge in experiment by buying cycle-cars. Nor, for that matter, need he buy unproved products, since the best proved ones are those available at the cheapest prices. But among some of the new style vehicles introduced there are some which, undoubtedly, will make a big reputation during the next twelve months. Therefore, if the individual medical man is not too much pressed for time, and has a talent for amateur mechanics, he may get good service out of some of the entirely new models introduced this year.

Sphere of the Air-cooled Engine.

We are far removed from the early days of the cycle-car, when the motor-cycle V-twin engine was mounted on a four-wheeled chassis to which it imparted an uncomfortable degree of vibration and through which it transmitted power by very crude and elementary mechanism. Yet, even in present practice, a certain design of 90 degrees twin air-cooled engine has gained a name rather for performance than for silent running, a point that applies in lesser degree to the horizontally opposed twin type. The strength of the Rover offer rests on the fact that it sacrifices performance to a degree that is not material to the average user in order to achieve quietness of operation to a degree that is most notable and desirable. It would appear that, on technical grounds, the noise developed by the working of most air-cooled engines in small cars, is due to the ringing of the cylinders and to the poor design of valve gear details. The "clothed" cylinder type of engine, wherein the crank case extends above the cylinder walls, should do away with much of such annoying resonance. Doubtless, in the fullness of time, power and silence will be combined in one design. But at the moment quite sufficient power is available, and silence has been obtained to a reasonable degree in the one outstanding example. It could be exploited by all the manufacturers who have introduced two-cylinder air-cooled vehicles, for which, however, I do not predict a great future unless they can be produced to sell at prices that cannot be matched by any four-cylinder type. Of course, at this period some buyers will favour certain types of two-cylinder vehicles that give pronounced speed performance with the inevitable noises. That sort of machine, however, is not to be recommended for the medical man; one reason is that the effect on the nerves is very trying if the driver has to sit behind an engine of that sort week after week, year in and year out. Refinement of working is a very important point in the prevention of fatigue. Further, too many of the small machines put on the market with various sorts of engine that give spirited performance are distinguished by cramped body accommodation, a fault that applies incidentally to most of France's popular car productions.

For the Country Doctor's Use.

Medical men should always look very carefully at the body scheme, and see that it is such as not to involve a quarter or a third of the driver's body being exposed to the wind owing to the narrowness of the wind-screen, the clipping of the scuttle scheme to achieve streamline form on a miniature body, and so on. Meantime the principle of air-cooling may be accepted as satisfactory for engines of the capacity and type we have been considering, for it has been shown on hills in Devonshire and elsewhere that some of these engines can stand hill-climbing within reason. If my district were mountainous I do

not know that I should buy an air-cooled engine for service year in and year out; but where it is a case of anything like average country, including hilly districts, I should have no hesitation in acquiring an example of really proved practice. It must be had in mind that these types are proportionately powerful for the weight they have to move. For example, the Rover engine develops quite 14-h.p., so that there is 1½-h.p. per cwt. of vehicle. Again, the A.B.C. air-cooled car, which has been on the market for over a year, can be taken from the West End of London right through the crowded thoroughfares of the City, and back again, for a couple of hours, crawling behind omnibuses, and so on, yet it will not become overheated. An air-cooled engine has to be made well by experts, for its shortcomings as a type, and without reference to any particular manufacturer, include unreliability due to poor workmanship and material; excessive oil consumption; insufficient attention to detail; general lack of refinement; and relatively unsatisfactory balance. As usual, it is a case of commercial competition. The firm with the best headwork, going about the business determined to make a success of it, will launch nothing without due preparation, and will succeed in getting the business because its product will give reliable if not showy service. But for every one that so succeeds at least a dozen would-be successful concerns are destined to failure because they have not taken the essential preliminary precautions.

The Coming Vogue of 1½ and 2 Litre Engines.

Having dealt with machines that come within the £350 and lesser price class, I now turn to a consideration of developments in the direction of nominal 10-h.p. to 14-h.p. machines. It is, however, necessary to point out first that the movement for providing greater horse-power for a given vehicle weight is general in British practice—at least, as far as machines up to the £16 tax are concerned. The tendency of the year's introductions of new models is, at last, to give attention, not to that minority of motorists who brag about speed attained on the flat, but to the vast majority of users who never want to go at excessive speeds along the level, but who wish to climb hills without effort, and like a car to accelerate in a manner which gives pleasure to the rider. From the moment engines were made more efficient and flexible it was possible to do this. But designers were conservative. Now, however, they have learned their lesson, with the result that we have small engines that have an excellently even torque, which is to say they develop good power practically throughout their range of crankshaft revolutions. This evenness of torque, combined with proportionately much lower gearing and lighter vehicle construction, enables a car to pick up in a way which has not been possible hitherto in the case of the middle and smaller classes of machines. We are at the opposite extreme of the early days of motoring, when every engine was overloaded and every car geared too high. Now we keep the power plant functioning well within its powers of performance.

It is plain that a new classification for motor engines may be expected in a very short time. One of the first of these is the two-litre size, which has been decided on by the French Automobile Club for the large car race for the Grand Prix next year. I remember being ridiculed in the technical press when, in 1914, I suggested that the small car class should be brought down to two litres at most, and that the large car class should be reduced to three litres. The latter was the size for the race this year. Now it is to be abandoned as being too large. Nowadays 130-h.p. can be got out of a three-litre engine, and proportionately good power out of a two-litre one. As to standard practice, there is introduced at the show the famous Ballot two-litre car, this being the only notable recruit to the industry of car building on the Continent this year.

European versus American Policy.

It occurs to me while writing these notes that it is remarkable no mention can be made of American contributions to these developments. The plain fact is that I know from technical developments in the United States that many new points are introduced to U.S.A. chassis this year for buyers in the States. But those new points are not illustrated at the current exhibition, and vehicles embodying them are not available for purchase in this country. Nor is this the only reason why I am bereft of material under this head. The American industry in general has decided, in the present conditions governing manufacturing operations in that country, that it is not possible to follow the lead of the foremost European houses in evolving these new-style small engines. Such engines require to be made to very close engineering limits: American builders do not think that a commercial proposition. That is fortunate for bankrupt Europe. It is precisely what our best motor engineers can achieve. Any visitor to the present show would be well advised to look at the design and the quality of the workmanship. The two-litre engine is illustrated by the introduction of a two-litre engined Minerva from Belgium; and, again, by a nominal 14-h.p. two-litre engine Sunbeam, and a similar type of Talbot car, both designed by Mr. Louis Coatalen. Round about this category there are many others, including the six-cylinder Singer F.A.C. types. Another size of engine which will certainly be adopted increasingly as a type—in face of the resumption by the Royal Automobile Club of racing in the Isle of Man with 1,500 c.cm. engine cars next year—is the 1½-litre engine. That was the limit for the 200 miles race at Brooklands recently, and, at an earlier date, for the French Voiturette Grand Prix race, and, earlier still, for the Italian Grand Prix race. The last named event was won by Bugatti cars at seventy-two miles an hour on a flat and straight course; the French Voiturette race at Le Mans was won by Talbot-Darracq at the same speed, though the course abounded in curves and varying gradients; therefore, by contrast to the Italian circuit, in France it was necessary to apply the brakes and to accelerate very often. The Brooklands 200 miles event was also won by Talbot-Darracq at 83.89 miles an hour, all which should be supplemented by the information that it is possible to-day, given fine weather as well as sound tyres, to travel 100 miles inside an hour on the track at Weybridge with a car of this engine volume. Before the war we should have thought it too small for a cycle car.

New Cars of Note.

As far as standard practice is concerned, we have at this exhibition, not a racing machine but an overhead valve engine 1½ litre, nominal 12-h.p. Talbot-Darracq which has half-elliptic rear springs, therefore its suspension is plangent and has nothing to do with the solid non-resilient type of springing needed for racing. Again, the car has a plate clutch, therefore the gear changing is rendered easy. Other examples could be cited, though, apparently, in face of the tardiness of the European industry to resume races after the war, designers have wobbled very badly and have not built their engines quite closely to these limits. Thus we get some going in for approximately 1¼ litre engines, others for about 1⅓ litre. But the generality are not at all "tidy" in their choice of volumes. In this connexion it would be far better if developments aimed always at certain definite volumes, since it is possible by these means to promote that healthy form of competition between manufacturers, even if they do not go in for racing, which makes for the maximum rate of progress in the minimum of time by gaining the greatest amount of interchangeable experience at the least cost. Nevertheless, under the heading of complete novelties in the relatively small car classes, I would advise the visitor to make a note to inspect the following, though not all of them are necessarily suitable for medical men. The point is that it will take but a few moments to glance at them, and by doing so the least technical visitor will begin to observe points (too numerous to be set out here), which will give him a basis for judging more accurately those designs which will be of service to him. All the cars mentioned in the following list are absolutely new models; it is not possible to give the prices in all cases at the time of going to press:

- £18 tax, six-cylinder, overhead valve, Armstrong-Siddeley, £575 chassis.
- £9 tax, 90 degrees twin-cylinder, air-cooled, Belsize-Bradshaw, two-three seater, £275.
- £10 tax, overhead valve engine 90 degrees twin-cylinder, air-cooled, B.S.A., with electric engine-starter, two-three seater, £340.
- £16 tax, six-cylinder A.C., 1,990 c.cm., with three forward speed gear-box embodied in the overhead worm-driven back axle; two-seater, £683.
- £8 tax, 5-h.p., four-cylinder, water-cooled Citroen; two-seater.

£8 tax, 7.9-h.p., V-twin, four-wheeled Coventry-Premier; two-three seater, £250.

£9 tax, 60 degrees twin-cylinder water-cooled engine Crouch with quarter-elliptic springs fore and aft, the front pair on a super-imposed principle, and original steering design; two-three seater, £285.

£20 tax, double sleeve valve engined, four-cylinder Daimler; chassis, £700.

£13 tax, four-cylinder, four-speed Delage, with four wheel brakes.

£12 tax, overhead valve engine Hotchkiss.

£14 tax, four-cylinder, double sleeve valve engined Minerva, with cantilever rear springs; chassis, £670; five-seater, £895.

£10 tax, four-cylinder, French-built Sa'mson, with three speeds forward, quarter-elliptic fore-and-aft springing; two seater, £285, with lighting set.

£13 tax, 14-h.p., four-cylinder, push-rod operated overhead valve, aluminium engine Sunbeam, with battery ignition and cantilever rear springs; chassis, £575; four-seater, complete, £725.

£16 tax, 15-20-h.p., four-cylinder Straker-Squire, with four-speed gear-box; four-seater, £725.

£12 tax, 11-h.p. Star, with single-plate clutch, central gate change; chassis £395; two-seater £495.

£10 tax, four-cylinder Singer, with quarter-elliptic springs fore and aft, and three forward speed gear-box; two-three seater, £395.

£16 tax, 15-h.p., six-cylinder Singer, with three forward speeds and cantilever rear springs; four-seater, £675.

£8 tax, four-cylinder Short-Ashby friction-driven two-seater, with central epicyclic gear control, cantilever rear springs, transverse front spring; complete £275.

£11 tax, 1½ litre 12-h.p. overhead valve four-cylinder engine Talbot-Darracq, with Delco ignition and electric starter, a single-plate clutch, three speeds forward, gear-box bolted to engine, spiral bevel final drive, cantilever rear springs: chassis £545; complete car, £596.

£11 tax, 10.5-h.p., four-cylinder Calcott, with three speeds forward, spiral-driven back axle; two-seater, £350.

£14 tax, 14-h.p. Vauxhall, with aluminium alloy pistons, engine starter housed at rear of crank-case casting and dynamo at front, three forward speeds, spiral bevel-driven back axle, cantilever rear springs; four-seater open car, £750.

£9 tax, 7-h.p. horizontally-opposed twin water-cooled cylinder Wolseley, with aluminium pistons, Blic battery, and coil ignition, three speeds forward, quarter-elliptic springs fore and aft; two-seater car, complete with electric engine starter, £310; without starter £295.

£21 tax Vulcan, with split single-sleeve valve Howard four-cylinder engine and overhead worm-driven back axle; five-seater, £1,050.

£8 tax, 8-h.p., 970 c.cm., four-cylinder water-cooled overhead valve engine Talbot-Darracq, with Delco electrical apparatus, single-plate clutch, three-speed gear-box, spiral-driven back axle, quarter-elliptic fore and aft springs; two-seater, complete, £325.

£14 tax, 2 litre, four-cylinder, 16 overhead-valves engine Ballot.

£9 tax, 10-h.p., four-cylinder monobloc Knight double sleeve-valve engine Panhard with reversed quarter-elliptic rear springs: four-seater, £615.

£9 tax, four-cylinder double sleeve-valve engine Voisin.

£13 tax, 12-h.p. Delaunay Belleville, with four-speed gear-box, pressed steel welded back axle; four-seater, £760.

£13 tax, 12.1-h.p., four-cylinder Delahaye; chassis £480.

£12 tax, 11.8-h.p., Vinot, with overhead-valve engine; chassis, £550.

£13 tax, 12.1-h.p., Chenard-Walcker with overhead valve engine.

£10 tax, 1,496 c.cm., overhead valve Dorman engine, four forward speeds, spiral bevel gear driven Seabrook with fabric disc joints at either end of the propeller shaft; two-four seater, £475.

£10 tax, 8-h.p., four-cylinder overhead valve water-cooled engine 11 cwt. Standard three-speed car; chassis, £275; two-seater, complete, £320.

£13 tax, 14-h.p. two-litre four-cylinder overhead valve aluminium engine Talbot with three forward speeds and cantilever rear springs; four-seater touring car, £725 complete.

£12 tax, 14 cwt., four-cylinder Wolverhampton-built Turner petrol car with four speeds forward, worm-driven back axle, quarter-elliptic rear springs; four-seater, complete, £550.

Proved and Improved Designs.

In addition to these novelties, attention should, of course, be given to the progress made by those manufacturers who introduced new style cars at the two previous post-war shows in London. This is particularly needful at the moment, in that there have been great reductions in prices. I am not referring to those vehicles that are a drug on the market, but to designs that are really up to date. These changes have been rendered possible by the more settled state of engineering labour, and by obtaining raw materials at lower cost. Under this head may be instanced the proved overhead valve engine, wholly post-war practice, 10-h.p. and 15-h.p. Wolseley cars, now available in considerably improved form at much lower prices. These are the sort of vehicles that have been copied by many of those who are introducing new schemes this year. Again, we have the four-cylinder side-valve engine 12-h.p. Rover, introduced in improved form as to detail, and at a very much lower price—namely, £650 complete. It is the cheapest of the 2¼ litre engine cars of British construction by a house of repute at this exhibition. Again, I have not included in the foregoing list of new models the 3 litre overhead valve engined 16-h.p. Sunbeam car, the power plant of which develops 60 h.p., and which is capable of a mile a minute, though its taxation rating is low. Of course it is a big departure for this pioneer Wolverhampton firm to have turned over entirely to overhead valve engines for all its models, including the 24-h.p. 6-cylinder type. The chassis of the 16-h.p. is merely developed in detail to accommodate the much more powerful plant now furnished to them for the same taxation rating. The complete vehicles, too, are put on at low prices, particularly when one examines the details of the design and production of the overhead valve gear employed. This is not what may be called the cheaper commercial type with push rod and rocker mechanism, but, like the Wolseley, it is an expensive design. Both are quite distinctive. The two larger Sunbeam models have four valves per cylinder. Than these no firms have more experience of the overhead valve engine. But where there are scores of new style cars it is impracticable to deal with each in detail. Instead, I would give passing attention to a few general tendencies.

All-weather Bodywork.

Apart from this being a year of cars that are cheaper, power for power, accommodation for accommodation, the cars are cheaper to run, and they are furnished in more complete fashion, as witness, notably, the Humber, Rover, Swift, Standard, Wolseley and such-like vehicles standardized complete with entirely original hood schemes that embrace, between them, some important points for the medical man. In short, we have arrived at a big forward stage in the development of the all-weather body without involving the production of an appreciably heavier, or a more complicated, vehicle, than the type that has formerly been equipped merely with what used to be styled a Cape cart hood. As to hood gear in general, it will be observed that a number of these types—for instance, the Rover—have the extension arms spring loaded. In other words, these arms might be spoken of as compensated, because practically no muscular effort is needed to raise, or lower, the particular hood. Independent of this hood gear, but designed in conformity with the scheme of it, the front and back doors are provided with windows fashioned some of aluminium, others of specially stiffened fabric, the opaque portions being generally of celluloid, whereby in stormy weather the vehicle can be turned in a few moments into a completely weatherproof machine enclosed as much as a saloon. Of course the cheapness and lightness of the innovation is notable. Nor is this all. These new "dummy" windows, which are made to open and close with the doors, are quite independent of the hood scheme, and can be kept up in fine weather when the hood is down. Therefore they are made to serve as wind or dust screens for the occupants of the front and of the back seats. Another development in this direction is illustrated admirably in the standard Humber bodies, wherein a form of wind-screen for the occupants of the back seat—quite different from the clumsy contraptions we have had in the past—is incorporated to fold out of sight when not in use, yet it is immediately accessible and takes but a moment to put into place, and does not interfere with easy access to the doors.

The Achievement of Greater Comfort.

The combined rear scuttle and screen will well repay the study of the medical man, in that the Humber arrangement completely protects the occupants of the back seat, just as the occupants of the front seats in cars with scuttle dashes are protected. The whole thing is very neat and light, striking a new note in coachwork details. Wolseley, Singer, G.W.K., and Swift are also doing good work in this connexion. It is far better to fit

devices of this sort than to place on the instrument board of a car the unnecessary clock, which seldom functions reliably. Hence its welcome disappearance from a number of specifications of standard cars. Another point is that the central gear change control tends to fall out of favour. This is natural, because it fouls ladies' dresses, and so on, especially in cars with front seat accommodation clipped to achieve streamline effects. But weight and material are being saved by the use of banjo type back axles such as were originated by Maudslay at a period when its production was expensive. Afterwards the principle was taken up in America, so that it is now one of the cheapest types, its only rival being the back axle fashioned out of two pressings bolted together, which is certainly quite the cheapest and also one of the strongest forms possible. The system saves weight. It is really a principle evolved by Lanchester years ago. In nearly all cases where new designs are employed manufacturers appreciate post-war driving, and see to it that the foot-operated brakes do not act on the countershaft and through the transmission gear, but on the back wheels.

Mechanical Tendencies.

The British industry lags behind the French one in the adoption of front wheel brakes, the ultimate coming of which into general use is now assured in that M. Henri Perrot's diagonal principle is supplemented by a really notable invention, by a French artillery officer named Hallot, wherein centrifugal force is so employed that, as the wheel slows, the braking effort becomes less until, the moment the wheel stops, the brakes are withdrawn automatically. Thus, should a wheel become locked during the application of the brakes, that wheel is forthwith released immediately and completely, so that skidding is impossible on that score. The single plate clutch and the spiral bevel-driven back axle all gain adherents. The worm drive retains its partisans, but does not gain any. The popularity of the bevel drive wanes. One interesting feature in connexion with the worm drive is the use of it by Lanchester to drive the magneto, a very notable refinement of which more may be seen. As for the magneto itself, it loses adherents, while dynamo-battery ignition gains a number. Carburation is now arranged much more generally with devices to control the mixture under varying conditions of service. Aluminium is much more used for making lighter parts; but the industry in general hesitates to use it for pistons. Horstmann of Bath shows a machine with foot-operated mechanical engine starter, and the new 8-h.p. Standard can be started either by crank in the ordinary way or by a lever beside the driver. The three-speed gear-box gains greatly in popularity here, though not so much on the Continent.

Valves, Gear-boxes, and Suspension.

There is a tendency for British constructors to build neat gear-boxes, bolted on the front ends of the torque tubes, though Singer has changed its practice in this connexion, and puts the gear-box in conventional position, instead of incorporating it in the back axle of the small car. As to taking the drive, the spring method is falling gradually out of popularity, for even on the new 18-h.p. six-cylinder Hotchkiss car, with a very original overhead valve operation mechanism to ensure silence, the drive is no longer taken through the springs but through a torque tube to the midmost frame transverse member. Other original valve gear is to be found on the Vulcan car already mentioned and on the Voisin machines. Wiring installations in connexion with electrical gear are very much improved. As to the growing use of the cantilever spring, it is noteworthy that very few of the Continental manufacturers trust it entirely for the rear suspension; French and Italian makers prefer to supplement it with devices for damping out oscillations when travelling at speed along the road. On one model Renault sets the rear springs at an angle to the side members of the frame, in place of parallel with them. Generally, in smaller constructions the gear-box is bolted up with the engine. "Straight-eight" engines are exploited only by the larger firms, with the solitary exception of Bugatti, who makes a 3-litre model of this sort. All the British makers introduce smaller cars than their previous models, with the exception of Singer and A.C., who introduce six-cylinder types, but as they are rated at only 15-h.p. each it will be appreciated that they are not large cars. For the small constructions fabric disc universal joints are increasing in use, Citroen being among those employing them. The straight-sided tyre has not materialized to the extent we were promised. But this is probably due more to extraneous circumstances, such as trade depression, than to normal mechanical tendencies. Therefore visitors to the show would do well to study the interesting exhibits in the tyre section by the leading manufacturers. When trying cars medical men may be advised to pay little heed to the registering of the speedometers on them; to form poor opinions of vehicles that have to be rushed at rises to climb them promptly; and to remember that a car that is noisy, ill-sprung, or given to vibrate will deceive the passenger as to the speed at which it is travelling, because it will give the impression of going faster than is actually the case. On the other hand, the more refined a vehicle the more likely it is that one will underestimate its speed.

Medico-Legal.

FRAUDS ON MEDICAL MEN.

At Greenwich police court on October 11th a man named Edward Thomas Johnson, described as an insurance broker of Forest Hill, was charged on remand with fraudulently converting to his own use the proceeds of a cheque for £15, of which he was bailee, the property of Dr. Denys Hallett. A clerk, W. H. Tomlin, was charged with being concerned with Johnson in obtaining the £15; also with obtaining other sums from other persons by false pretences. According to a report in the *Woolwich Herald* (October 14th), Mr. Lewis, for the Public Prosecutor, said that the prisoners had made statements admitting the offences, and Johnson had given a list of the doctors from whom he had obtained money. It appeared that Johnson wrote a letter to Dr. Hallett, in which he said it was necessary for him to arrange with a doctor in his district to examine candidates for life and accident insurance; that the fees would be one guinea for life insurance and 10s. 6d. for accident; and that he would be guaranteed 60 guineas in the year. The medical man accepted the position, and at Johnson's request agreed to effect an insurance on his own life, paying Johnson £15. This sum Johnson converted to his own use. The man Tomlin and a youth named Morris were sent to Dr. Hallett for examination, false addresses being given. In the other cases a similar procedure was adopted by the prisoners. Both prisoners pleaded guilty and expressed regret. The magistrate, Mr. Disney, committed Johnson for twelve months' hard labour, and Tomlin for six months.

The report of these proceedings in the Greenwich police court comes opportunely. As lately as September 17th we published in the Supplement a Current Note headed "Insurance Policies: A Warning," reminding medical men once more to be on their guard against making payment to persons calling upon them and representing themselves to be insurance brokers. The warning was prompted by a particular case brought to the notice of the British Medical Association, in which a person representing himself as an insurance agent offered a doctor medical examinations for various insurance offices on the understanding that he took out a policy through his agency. We understand that the Medical Defence Union has received several complaints against the man Johnson and his accomplice, and had already put before the Public Prosecutor the facts of two cases of a similar character, although neither of these formed the subject of charges at the Greenwich police court.

The Society for Cinematographic Instruction, New York, has devoted the past eighteen months to experimental work in hospitals and laboratories in order to ascertain the applicability of the cinematograph to the study of medicine, surgery, and dentistry; it is stated to be possible to record accurately and permanently every detail of any minor or major surgical operation. The society intends to establish a central cinematographic library in New York, and members and institutions will be able to rent or purchase at a nominal charge copies of the films. An exchange arrangement, we are informed, is also being negotiated with the medical profession in a number of European countries. Dr. James S. Edlin, New York, is president of the society.

Figures compiled by the Department of Public Welfare of the City of New York show that in 1918 there were 116 drug "addicts" under the care of the city hospitals, 339 in 1919, and 493 in 1920; for the first six months of the present year there were 337. The number of cases of alcoholism under the care of the city hospitals in 1919 was 1,145, in 1920 it was 1,024, and during the first six months of 1921 there were 567 cases.

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THE SCOPE OF SURGERY IN GENITO-URINARY TUBERCULOSIS.

THE four papers on renal tuberculosis published in the tenth volume of the *Transactions of the American Association of Genito-Urinary Surgeons*, and the article on the radical cure of tuberculosis of the seminal tract, contributed to the thirteenth volume of the same publication by Dr. H. Hampton Young, together constitute a valuable contribution to the discussion of the subject of genito-urinary tuberculosis. In it are reflected the views of American urologists on a topic of great practical interest. The first paper deals with the possibility of spontaneous recovery in renal tuberculosis. Tuberculous lesions elsewhere in the body may, under favourable circumstances, become shut off by surrounding fibrosis, absorbed, and finally entirely replaced by scar tissue. The question is whether the same can happen in the case of a lesion in the kidneys. An answer to such a question may rest either on clinical observations or on *post-mortem* observations. Great care must, however, be exercised in accepting evidence of spontaneous recovery from renal tuberculosis when that evidence rests only on clinical history. How easy it is to assume healing without sufficient proof is shown by three cases of Keyes, quoted by Dr. Edward L. Young. In these an entire remission of symptoms occurred, and in one instance the relief lasted seventeen years. Nevertheless, in all three cases a subsequent nephrectomy or necropsy revealed the fact that in spite of the absence of symptoms no true healing of the renal lesion had actually occurred.

Nor is the evidence in favour of the spontaneous healing of renal tuberculosis any stronger when it rests on *post-mortem* observations. It is true that a few pathologists have reported the presence of cortical scars which they believed to represent healed tuberculous lesions. It is also true that Harbitz and Delbet include amongst these healed lesions certain cases in which encapsulation rather than true healing has taken place. Responsible pathological opinion is, however, all in favour of the view that such occurrences are rare. On this account dependence upon general measures of treatment when renal tuberculosis has once been diagnosed is obviously dangerous. The only hope of dealing successfully with a lesion in the kidney is nephrectomy. Wildbolz, recognizing that a marked improvement in general condition follows the use of tuberculin in many cases, gave it a trial in four patients previous to operation. Although the general health of these patients materially improved, when he came to do nephrectomy later on he found no evidence of healing in the kidney. He concluded, therefore, that although medical treatment may improve the general condition of the patient, it does not in the least help the local lesions. This being the experience of practically all genito-urinary surgeons, nephrectomy is now recognized as the only possible means of a radical cure in the case of renal tuberculosis.

With regard to the details of operation, surgeons differ considerably: some undertake very extensive dissections of the ureter and fatty capsules in the hope of removing as much of the infected tissues as possible, whilst others are content merely to remove the kidney and to trust to the patient's resistance to overcome any infection left behind; as a result of these differences considerable variations in mortality are found in different clinics. Even when the lesions of the genito-urinary tract are extensive the beneficial results of the nephrectomy are usually very obvious. Indeed, Cabot and Crabtree have noted that very early cases with small multiple foci in the kidney often do not recover as well as those cases in which there is a larger localized abscess. In other words, according to these authors, the results of nephrectomy in cases of later tuberculosis are more dramatic than those obtained at an early stage of the disease.

Whilst little doubt can be felt that excision offers the best hope of cure in dealing with tuberculosis of the urinary tract, the same cannot be said of the treatment of genital tuberculosis. Here a marked divergence of opinion amongst authorities exists. The subject is rendered more difficult by the fact that the pathology of genital tuberculosis is in dispute; opinion is still divided as to whether the spread is from the epididymis to the prostate and vesicles or in the contrary direction. Until this question is settled the surgery of genital tuberculosis rests on uncertain ground. The subject is fully dealt with by Dr. Hugh H. Young, who advocates extensive operations. He shows that such operations as orchectomy and epididymectomy have conspicuously failed, the disease reappearing at a later date in the testicle of the opposite side. The reason of this is that the prostate and vesicles are almost invariably infected as well as the epididymis. The removal of a testicle can afford little hope of saving the organ on the opposite side if these central prostatic and vesicular lesions are left behind. The only logical method of dealing with the condition surgically is to remove the vesicular lesions as well as those in the testicle, and it is in support of such a proceeding that Dr. Young has written his paper on the radical cure of tuberculosis of the seminal tract. In order to show that his advocacy of these somewhat severe surgical measures rests on sound pathology, he reviews the evidence in favour of this centrifugal spread of the tubercle from the prostate and vesicles. He quotes in particular the work of Mr. Kenneth M. Walker on this subject, as showing conclusively how futile it is to hope completely to eradicate tubercle of the genital tract by epididymectomy or castration alone. According to Mr. Kenneth Walker's observations, the path along which infection of the epididymis travels is precisely the same in tubercle as in gonorrhoea. The infection is descending and for this reason the earliest portion of the testicle to be attacked is the lower pole of the epididymis. By inoculating the urethrae of animals with various easily identified organisms and subsequently searching for them in various portions of the genital tract, Walker showed that tubercle bacilli can reach the testicles from the posterior urethra along the lymphatics of the vas, even although this is against the direction of the lymph flow. In his opinion, Baumgarten's failure to produce a descending tuberculosis in rabbits was due, not to any inability of the tubercle bacillus to reach the testis from the posterior urethra, but to the fact that the soil had not been prepared for its activity by, say, a previous injury. If before inoculating the posterior urethra with tubercle bacilli the testicle was damaged descending tuberculosis ensued.

If the truth of this be granted—and Dr. Young's clinical observations are entirely in harmony with

Mr. Kenneth Walker's pathological investigations—excision of the seminal vesicles and prostate is the only possible method of eradicating seminal tuberculosis by surgical means. Dr. Young gives a full description of the technique and the results obtained from such methods. The first stages of the operation are similar to those of a perineal prostatectomy. The infected vas is removed after division at the point at which it crosses the ureter by traction through a small incision made over the external ring. Although it is a severe operation, there has only been one death amongst the fifteen cases operated upon by the author, and that occurred a year after operation. Many of the patients were in an advanced stage of the disease and suffered in addition from pulmonary lesions. In all the cases excellent local results were obtained and there was a marked improvement of general health.

Although in the hands of certain skilled surgeons such a formidable proceeding as excision of the vesicles and prostate appears to have given excellent results, it is greatly to be doubted whether the operation of epididymo-vesiculectomy will be accepted as the appropriate treatment for tubercle of the genital tract in the same way that nephrectomy has been recognized as the only justifiable treatment for tubercle of the urinary tract.

Fortunately, genital tuberculosis differs materially in character from urinary tuberculosis. The processes of repair that we have found to be lacking in tubercle of the kidney are much in evidence in tubercle of the genitalia. Every surgeon has seen cases of genital tuberculosis in which, after the disease has run a long course and affected both testicles, repair and cicatrization have finally triumphed, the patient, to all intents and purposes, recovering from his genital lesions. Although excision of the genital tract may not come into general favour, yet it is undoubtedly a procedure which has a very definite place in the treatment of certain selected cases, and for this reason, if for no other, Dr. Hugh H. Young has done valuable work in perfecting the technique of the operation and in bringing the results he has obtained to the notice of the profession.

MORTALITY IN THE EIGHTEENTH CENTURY.

Our knowledge of the rates of mortality in Europe before the middle of the nineteenth century is very slight. Sweden is the only country in which accurate census enumerations and substantially correct returns of deaths have been compiled continuously since 1750. Our own Government so long ago as 1753 introduced a bill "for taking and registering an annual account of the total number of the people, and of the total number of Marriages, Births and Deaths, and also of the total number of the poor receiving alms from every parish and extra-parochial place in Great Britain." But the measure had to encounter considerable opposition; one honourable member "did not believe that there was any set of men, or, indeed, any individual of the human species so presumptuous and so abandoned as to make the proposal we have just heard," and held the project to be "totally subversive of the last remains of English liberty." Another remarked that his constituents "looked on the proposal as ominous, and feared lest some public misfortune or an epidemical distemper should follow the numbering." These arguments seem not to have prevailed against those of the Government whips in the Lower House, but, as was noted recently, the Peers rejected the bill on second reading; nothing more was done for nearly fifty years, and enough was not done then to carry out the programme we have quoted. Farr was able to make a fairly accurate comparison between the rates of mortality in London at different periods; he estimated the crude death rate in 1629–35 as 50 per 1,000, in 1728–57 as 52 per 1,000, and in 1831–35 as 32 per 1,000, but for the rest of the country we have hardly any data.

In the current number of the *Zeitschrift für Hygiene und Infektionskrankheiten*[1] Kisskalt publishes an interesting study of death rates in the eighteenth century, largely based upon the archives of the city of Königsberg. He has been able to determine the populations, numbers of deaths, and, to some extent, the causes of death during the last thirty years of the eighteenth century. The following are among the more striking results of his comparison between the end of the eighteenth century and the last twenty years before the war:

In the first year of life the rate of mortality was not very different at the two epochs, at least in Königsberg. The rates per 1,000 births were 217 in the eighteenth century, 258 from 1894–1903, and 186 from 1904–13. A noteworthy point is the fact that, although the infant mortality in Königsberg in our time shows the familiar summer elevation, there is no trace of this in the eighteenth-century records. The obvious explanation, that breast feeding was commoner in those days, may, Kisskalt thinks, be the true explanation, since the mortality of children in the second year of life did have a summer maximum. But, as he observes, it is hard to tell whether breast feeding was really more common, and he quotes an illustration of the fact that the habit of scolding mothers for their neglect, which some may have imagined to be peculiar to public spirited spinsters of the modern upper classes, was in full working order in 1784.

Mortality at ages 2 to 10 was far higher in the eighteenth century than now. In the second year of life it was 106 per 1,000 (average of the years 1774 to 1803); an important component was small-pox, to which Kisskalt devotes special attention. Taking the mortality at all ages, the average was 2.32 per 1,000, the maximum 8.58, the minimum 0.11. In one year more than 20 per cent. of the gross mortality was due to small-pox, and in nine years (out of thirty-one) more than 10 per cent. The second year of life was the most dangerous age. Kisskalt reckons that of every 100 born 11.4 died of small-pox before attaining the age of ten, a result in agreement with that of an eighteenth-century writer, Lange. Vaccination was introduced into Königsberg in 1803, but at first made very little progress, partly because of the unfavourable opinion of its effects entertained by the great intellectual lion of the city, Kant, whose biographer unkindly attributed the sage's utterances on the matter to the effect of "strange opinions and theories sporting with extremely moderate powers of observation conjoined to a once penetrating intellect." However this may be, the epidemic of 1803 was a severe one. But the epidemics of 1806 and 1809 were much milder, and thereafter small-pox ceased to be a formidable scourge.

Measles in the eighteenth century was a greater cause of mortality than in our time, but Kisskalt does not find any difference in the epidemiological succession; his data are not, however, suitable for an exact study. Scarlet fever, unlike measles, was not more fatal at the end of the eighteenth century than now, while Kisskalt can find no indication of any epidemics of diphtheria.

[1] Vol. xciii, pp. 438–512.

Two pandemics of influenza fell within the period studied. That of 1782 produced a mortality comparable with the influenza of 1890—about 1.3 per 1,000; the influenza of 1800 seems to have been rather more severe. Kisskalt's memoir, to which he has appended an excellent bibliography, is a valuable contribution to the literature of medical statistics.

THE CURE OF SLEEPING SICKNESS.

As was mentioned in a recent issue of this JOURNAL,[1] the Colonial Office is supporting the Tropical Disease Prevention Association in sending out to Africa a special mission under the senior medical officer in Uganda, Dr. Claude H. Marshall, to investigate the serum treatment of trypanosomiasis in man and animals; we understand that an outlay of £50,000 is contemplated. The treatment of sleeping sickness has always left much to be desired from the point of view of efficacy, and it is possible that the most promising results hitherto obtained have been those recorded by Dr. Marshall himself and detailed in recent issues of the BRITISH MEDICAL JOURNAL.[2] The method of treatment employed consists in the intravenous injection of salvarsan or neo-kharsivan, followed three hours later by the withdrawal of 2 oz. of blood from the patient; a quantity of the salvarsanized serum obtained therefrom is then injected into the patient's spinal theca. It is claimed that this method of treatment may be regarded as a "cure" for trypanosomiasis—fatal to the parasite, which is notoriously capable of lurking for months or years inactive within the human organism, but not fatal to the host. We have received from Dr. Warrington Yorke a critical review he has published[3] of recent work on the treatment of sleeping sickness, in which he casts doubt upon the efficacy of Dr. Marshall's method of combined intravenous and intrathecal treatment; the record of his experimental results is criticized also. The intrathecal method of treatment with salvarsanized serum was tried by Van Someren,[4] with results that were not encouraging, in 1910, and again in 1914 by Reichenow without success. According to Dr. Yorke, two fundamental assumptions underlie the work of Dr. Marshall and his collaborator, Dr. Vassallo. The first assumption is that although the administration of one dose of salvarsan, neo-salvarsan, or atoxyl, is sufficient to sterilize the blood stream, symptoms reappear within a variable period, averaging about four months, and the disease progresses to a fatal termination; Dr. Yorke produces evidence to show that a large percentage of the patients treated by one or more intravenous arsenical injections may survive for at least three to seven years or more. The second assumption is that in trypanosomiasis the parasites appear to gain an impregnable position in the central nervous system, whence they are later able to reinfect the blood stream. Dr. Yorke shows reason to believe that relapses after treatment occur in cases in which the cerebro-spinal fluid is sterile; that in the absence of intrathecal treatment an infected cerebro-spinal fluid may become sterile; and that patients may live for prolonged periods, and possibly even recover, after the cerebro-spinal fluid is invaded. He argues that Dr. Marshall and Dr. Vassallo have brought forward no evidence to show that an intrathecal injection of salvarsanized serum produces sterilization of the cerebro-spinal fluid. Dr. Yorke has examined the literature of the subject and tabulated the results of various kinds of treatment therein recorded, and also of the duration of the disease in untreated patients. His main criticisms may be summarized by saying that the method of treatment employed by Dr. Marshall is not new and has already failed in other hands; that no satisfactory evidence is produced to show that intrathecal injections of salvarsanized serum are able to sterilize infected cerebro-spinal fluids; and that the results so far published fail to substantiate the claim that the treatment gives better results than any hitherto obtained by other methods. Dr. Yorke's criticisms are so well documented and so ably put forward as to give the reader pause. There can be no doubt, on Dr. Yorke's showing, that the present treatment of the disease is in urgent need of improvement, and, no less, of further investigation and experiment. But is it equally certain that the serum treatment employed by Dr. Marshall is deserving of the full confidence placed in it by its employer and his supporters? It would seem that the *therapia sterilisans magna* of trypanosomiasis is still to seek, and that the special mission sent out to Africa by the Colonial Office will find itself with more to do than merely to practise the method of treatment already employed by Dr. Marshall, with results open to the severe criticism they have received from Dr. Yorke.

[1] BRITISH MEDICAL JOURNAL, September 10th, 1921, p. 415.
[2] Ibid., May 22nd, 1920, p. 702; May 28th, 1921, pp. 773, 777; and August 20th, 1921, p. 284.
[3] *Tropical Diseases Bulletin*, London, 1921, xviii, 155.
[4] BRITISH MEDICAL JOURNAL, 1910, i, 195.

PRESENTATION OF THE JENNER MEDAL.

THE Jenner medal for distinction in epidemiological research was presented to Sir Shirley Murphy, K.B.E., F.R.C.S., late medical officer of health of the Administrative County of London, at a meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine on October 28th. Dr. A. K. Chalmers, the President of the Section, in making the presentation, said that the Jenner medal was instituted twenty-five years ago by the Epidemiological Society, which at a later date was merged into the Royal Society of Medicine. The object of the medal was to confer distinction on those whose work had been prominent in the prevention and control of epidemic disease, and so jealously guarded was this honour that there had been only three previous recipients. It was the unanimous decision of the Council of the Section that Sir Shirley Murphy's name should be added to this short and brilliant list. As first medical officer of health to the London County Council, Sir Shirley Murphy had had wide opportunities for research along administrative lines, and one result was a series of annual reports, extending over almost a quarter of a century, and embracing almost every relationship between disease and environmental conditions. On the formation of the London County Council the whole problem of the central sanitary administration of London had to be considered and developed. One of the most urgent problems was the clearance of insanitary areas, and to this task Sir Shirley Murphy devoted himself with conspicuous zeal. The metropolitan water supply had to be considered, and it fell to Sir Shirley Murphy's lot to advise the Council with regard to the pollution of the Thames and the Lea. The question of scavenging was taken in hand with much energy, with the consequence that London became one of the best scavenged cities in the world. Sir Shirley Murphy had done a great work in countering the spread of scarlet fever and diphtheria among the children of the elementary schools. London was also one of the first authorities to make cerebro-spinal fever, poliomyelitis, and ophthalmia neonatorum notifiable. Quite early in his career, as Medical Officer of Health for St. Pancras, Sir Shirley Murphy had demonstrated the association of an outbreak of enteric fever with milk distribution. In the course of his official career he had served on several Royal Commissions and prepared many memoirs on important public health questions. In that Section also they recalled his terms of office as secretary and as president of the Epidemiological Society. Sir Shirley Murphy, on receiving the medal, said that he knew that this bronze emblem was valued in the highest degree by every student in epidemiology. He valued it all the more because the Section of Epidemiology at the present moment contained an unusual number of men who

had themselves done the most brilliant work in epidemiological inquiry. He concluded with an affectionate tribute to the officials of the London County Council who were his more immediate colleagues, and especially to Dr. Hamer, his successor, whose services to him, not least as critic, he could never forget.

CENTENARY OF THE CITY OF LONDON MEDICAL BOOK SOCIETY.

The annual dinner of the City of London Medical Book Society, held at the Abercorn Rooms on October 25th, celebrated the centenary of the society, which was founded by twenty general practitioners in a house in Frederick's Place, Old Jewry, in May, 1821, "for the circulating of books on medical, surgical, and philosophical subjects." In 1824 membership was limited to practitioners in the City, from Temple Bar to St. Mary Axe and from Finsbury Square to the Thames. The society is apparently the oldest medical book society in the kingdom which has remained since its foundation strictly a book club for the circulation of medical works among its members, without holding any meetings for discussions except an annual dinner. It was appropriate that Dr. Arthur Davies should be in the chair at the centenary dinner, for there has been a Dr. Davies in the City of London for over a hundred years, his father and grandfather preceding him there. Dr. W. Langdon Brown proposed the toast of the Society, referring to the important part played by the chairman's grandfather, Dr. Thomas Davies, in the development of medical science in England a century ago by having been the first to introduce Laënnec's early stethoscope into this country. Dr. Arthur Davies, in his reply, described the conditions of medical practice in the City a hundred years ago. The whole of the Finsbury district was then extremely charming, and beautiful country was almost at the door; many medical practitioners there must have had country as well as city practices. The woods and groves might perhaps have inspired Keats, who was born at 28, Finsbury Pavement, and, as a licentiate of the Society of Apothecaries, practised medicine to a certain extent from 1810 to 1817. New Broad Street, and later, Finsbury Square and Finsbury Circus, were the favourite localities for doctors in those days. The most outstanding figure of the time was Sir Astley Cooper, who practised at the corner of Bishopsgate Church Yard. The first minute book of the society was on exhibition at the dinner. It was lost for forty years, and recovered some years ago by the exertions of Dr. Jossé Johnson and Dr. Buxton Shillitoe. The number of members has always been limited to twenty, and the subscription was at first one guinea; later this was replaced by "a liability to a call when the funds rendered it necessary," the income of the society coming mainly from fines for retaining books and for absence from the annual dinner, and from the annual auction of books after the dinner. A number of old members of the society were present at the centenary dinner, and in addition to Dr. Wingrave, who proposed the health of the guests, the speakers included Dr. Appleford, who was secretary from 1885 to 1891, and Dr. H. Jossé Johnson, who was secretary from 1899 to 1902, and wrote the history of the society.

INQUESTS INADEQUATE THROUGH LACK OF NECROPSY.

One of the reasons why the result of so many coroners' inquests is unsatisfactory, and in many cases even quite useless, is that the medical evidence is incomplete. In not a few instances this want of completeness is due to the fact that the coroner has not directed a *post-mortem* examination to be held. All this has been explained and the evil results pointed out again and again, during the last thirty or forty years in our columns, in letters from correspondents and in editorial articles. It is interesting to have these criticisms confirmed by a county court judge, who was looking at the matter from a particular point of view. In the course of an arbitration under the Workmen's Compensation Act, held at the Chester County Court on October 18th (reported fully in the *Chester Observer* of October 22nd), it was stated that a blacksmith was employed in putting an iron tyre on a wheel; after striking the tyre he walked away, collapsed suddenly, and died. He had never been attended by a doctor. Dr. Carlyle Sutton, who was called, stated in evidence that he found the man lying dead. The primary cause of death was, in his opinion, syncope, accelerated by the strain of laborious work and the excessive heat. It was submitted by counsel for his employers that the workman died from natural causes, and that there was no evidence of unusual strain. Dr. William Lees, of Chester, said in evidence that as there had been no *post-mortem* examination it was not possible with absolute certainty to state the cause of death. Coroners' inquests, he added, were often valueless, because the doctor was not directed to make a *post-mortem* examination. Security to human life was very much diminished by the absence of these precautions. If there had been a *post-mortem* examination in this case there would have been a much better chance of ascertaining definitely the cause of death. From what he had heard in court he thought that the workman had a high blood pressure and a dilated heart and that he had died of syncope; he had not heard that the man was subjected to any unusual strain on the day he died. With the intense heat prevalent in the first days of July a man in that physical condition would be liable to die suddenly while walking or working. His Honour Judge Parsons gave his award in favour of the respondents, the workman's employers. He was inclined to the opinion, he said, that a serious injustice might have been done in this case, because a *post-mortem* examination was not held. He hoped that those who were responsible for the conduct of coroners' inquests would in future bear in mind the grave importance of a *post-mortem* examination in a case like this, where the cause of death was not obvious from the surface indications, and where serious interests might be involved.

PITCAIRN ISLAND.

Those who have read the story of the mutineers of the *Bounty* will remember that Pitcairn is a small and lonely island that rises abruptly in the Pacific Ocean. Just over 130 years ago nine of the twenty-five mutineers, who had set their captain adrift in the launch, made their way to Pitcairn Island, together with six Polynesian men and twelve Polynesian women, and burned the ship. Ten years later all but one of the men were dead; the survivor, John Adams, became the patriarch of the little community. At long intervals the island colony was visited by passing ships. About the middle of last century the whole population—less than 200 in all—moved to Norfolk Island, but some of them soon found their way back. Through the courtesy of Dr. H. W. Mann, surgeon to ss. *Ionic*, we have been able to see his medical report on Pitcairn and its inhabitants, submitted by him to the High Commissioner for the Western Pacific, within whose jurisdiction the island lies. The visit was paid by boat last June in company with two passengers, Dr. Colquhoun of Dunedin, and Dr. Frank Nyulasy of Melbourne. It coincided with an accident to three of the islanders, whose boat had been dashed against the rocks in a rough sea. Owing to high seas the usual anchorage could not be used, and the three medical men landed on a rocky shelf in a small cove on the western side of the island; though that side was comparatively sheltered, the surf made disembarkation a trying and risky business. Led by guides, they toiled up an almost precipitous slope to a knife-edge rocky ridge; the contrast between the arid sun-scorched rock on the north and the dazzling tropic beauty on the southern and eastern sides

was an unforgettable experience. Two of the injured islanders were already dead; the third was much bruised and crushed, and had sustained a fracture of the right femur. After consultation it was decided that his removal to the ship for care and treatment was out of the question in view of the rough weather prevailing, the distance, the bad roads, and the indifferent transport available. He was therefore made as comfortable as possible, written instructions were left with his relatives, and a further supply of comforts and dressings was procured from the ship's surgery. Apart from this unhappy accident there was no sickness on the island, and no one needed medical care. On inquiry Dr. Mann was told that the influenza pandemic of 1918–19 reached Pitcairn, and caused only five deaths, which he considered a small mortality compared with the enormous toll taken of other native communities. "While having many positive qualities," he writes, "such as clear fresh air, sunshine, fruit in abundance all the year round, yet in other respects Pitcairn may be termed a land of negatives. No house rent, rates, or taxes, no drink, almost no tobacco, no money, no poverty, no riches, no disease, no toil, no city smoke, and, though emphatically an inbred race, no evidence of degeneracy. I saw one fair-haired blue-eyed boy, but the bulk of the people are Polynesian in type, oval faces, olive complexion, lithe, active, and having easy springy movements, and a fine erect carriage." The islanders go barefooted from their earliest days, and so can walk firmly and confidently over bare rocky slopes; not merely the great toe, but all the toes seem to have acquired a prehensile power, the result of this early education in hill climbing. Surnames are few and reminiscent of the *Bounty*—Adams, Young, Christian, McCoy, Warren. The men and young people have no head covering, but the women wear hats made by themselves from the leaf of the Pandanus. The water supply is got from springs in the hillside, and is abundant and apparently good. Sanitation is carried out on a modified latrine system. Fruit and cocoanuts abound, and Dr. Mann notes his pleasure at seeing and smelling English roses in the gardens. Two things impressed him most: the radiant beauty of the prospect from the "Divide" on the top of the northern rocks, and the fine fortitude of the people under the crushing misfortune of a sudden loss of two breadwinners out of a small community of 176. The islanders are proud of their British nationality and speak the English language; they have a deep love for their island and do not wish to leave its primitive communal life in the midst of the blue Pacific. The report ends with a practical suggestion that in view of accidents two native women of suitable age, disposition, and intelligence, should be chosen for training in hospital nursing and maternity work in an Australasian or English hospital, and that a supply of first-aid appliances be maintained for the use of the people of the island.

THE RADIOLOGICAL ASSOCIATION.

At the annual general meeting of the British Association for the Advancement of Radiology and Physiotherapy (B.A.R.P.) the President, Dr. Robert Knox, in reviewing the work accomplished since its foundation four years ago, said that the initial steps towards the institution of the Cambridge diploma in medical radiology and electrology had been taken by the Association, which approached the Senate of the University on the matter; though it had, of course, acted quite independently, the University had consistently sought the advice of the B.A.R.P., and had recognised the course of instruction organized by it in London as qualifying for admission to the examination for the diploma. At the same time as the negotiations were going on with Cambridge, a special subcommittee, formed in conjunction with the Institution of Electrical Engineers, was engaged in considering the training and organization of lay assistants in *x*-ray and electrical departments; as a result the Society of Radiographers was formed with a council of eighteen members, of whom six are appointed by the B.A.R.P. and six by the Institution of Electrical Engineers, the remaining six being elected by the members; the constitution was approved by the Board of Trade and the General Medical Council. Its diploma of membership (M.S.R.) is obtainable by examination only, and members undertake not to accept any patients for diagnosis or treatment except under the direction of a qualified medical man. Recently the association had initiated the policy of issuing authoritative statements on medical subjects to the daily papers. There were objections to the frequent appearance of individual names in the public press, yet at times the need of enlightening the public on technical matters was urgent. The issue of manifestos approved by the council, but otherwise unsigned, was held to fulfil the joint requirement of being authoritative and at the same time free from any suggestion of personal bias. The B.A.R.P., in addition to standing business, educational, editorial, and technical committees, had a Medico-Political Committee, which had, however, not felt in a position to take up a firm stand in dealings with Government departments and municipal bodies until a certificate of incorporation had been obtained. The business had imposed much labour on the secretaries, Dr. Alastair MacGregor and Dr. Hernaman-Johnson, and had been somewhat costly, but was now concluded and the certificate of incorporation issued. Besides giving the association a definite legal standing, it enabled it to hold property, receive legacies, and originate petitions to Parliament. Dr. Knox went on to say that he hoped some day to see in London an institute of radiology and physiotherapy housed in a building worthy of the extent and importance of these subjects, having its own museum and library, and perhaps having its own clinic, so that every possible facility for teaching and research in radiology and allied subjects might exist in the capital of the empire. These ideals could be realized only if the B.A.R.P. were supported by all medical men throughout the country who were interested in electrical subjects, no matter whether they specialized exclusively in them or not. The affairs of an organization such as the B.A.R.P. must of necessity be run largely by a council, and the council meetings would naturally be attended most often by members living within a hundred miles of London. He thought that the best way of safeguarding the interests of the provinces would be the formation of branches of the B.A.R.P. A Wessex branch had already been formed, and he hoped to see others in the near future. The branch organization desirable for scientific meetings was vital in medico-political matters. It would be extremely difficult for the central organization to support a provincial member in a local dispute unless a district branch had prepared the ground.

THE TENTH INTERNATIONAL CONGRESS OF OTOLOGY.

There has been no International Congress of Otology since the meeting in Boston in 1912. The various national committees then appointed have been canvassed and have selected Paris for the tenth Congress. The date first selected was July 26th–30th next year, but, when it was pointed out to our French colleagues that this date would clash with the meeting of the British Medical Association in Glasgow, they most courteously altered the date to July 19th–21st. Their cordiality and goodwill towards this country has been further marked by a special visit of their Secretary-General, Dr. A. Hautant, to attend the annual dinner of the Section of Otology of the Royal Society of Medicine, under the chairmanship of Sir Charles Ballance, and to join in the first meeting of the Section on October 21st, when the new president, Dr. Logan Turner, occupied the chair. Dr. Hautant extended to otologists in this country a most cordial invitation to the Congress next summer, and to this invitation a wide response is assured. A committee of organization for Great Britain and Ireland

has been appointed, with Professor Urban Pritchard as president, Sir StClair Thomson as chairman, and Mr. Lionel Colledge and Mr. J. S. Fraser as honorary secretaries. Over a hundred otologists have already sent in their adhesion to the committee, and all who are interested are invited to apply to one or other of the honorary secretaries. Those who do so will be kept informed of all the arrangements for the Congress as they develop. The office-bearers in Paris are Professor P. Sébileau (President), Dr. Georges Laurens (Treasurer), and Dr. A. Hautant, 28, Rue Marbeuf (Secretary-General). Although the Congress remains in name purely otological, it is intended to embrace both rhinology and laryngology. Professor Sébileau is known not only as an otologist, but as a leading exponent of the surgery of the nose, throat, and neck. We are glad to hear that the executive of the Congress has resolved not to encourage the reading of papers written to order, but to give the meeting a thoroughly practical character. The mornings will be devoted to visits to clinics, operating theatres, and museums.

CAROTINAEMIA.

During the war there occurred a considerable number of cases of picric acid jaundice with the following picture: a yellow tint of the skin and conjunctivae, yellow blood serum, and a pomegranate-coloured urine due to picramic acid and not to bile pigment; epidemics of this condition among malingerers were recorded. In Germany, when war conditions necessitated a more vegetarian diet, a number of healthy children showed yellow pigmentation of the skin, but not of the conjunctivae, due to carotin—the pigment contained in carrots. The term "carotinaemia" was employed in 1919 in America by Hess and Myers, and quite recently Drs. G. D. Head and R. A. Johnson[1] have reviewed the subject and recorded an adult case in a diabetic who was on a diet rich in carrots. This condition had previously been noted in diabetics, and von Noorden's fifteen cases of "xanthosis diabetica" appear to have been of this nature. In carotinaemia the skin, especially of the palms and soles, the forearms, naso-labial folds, cheeks, and forehead, takes on a colour varying from a lemon-yellow to a rich orange, which can be easily distinguished from true jaundice by the absence of any conjunctival change. The blood serum shows the presence of carotin chemically and spectroscopically, and when carrots are excluded from the diet the colour gradually fades. The cutaneous pigmentation may annoy the individual, as in Drs. Head and Johnson's diabetic patient, but otherwise there are not any bad effects. The yellow pigment carotin is not confined to carrots; together with xanthophylls, it is included in the carotinoids, which are widely distributed in nature; the yellow colour of fats, corpus luteum, yolk of egg, and milk is due to the carotinoids, often called "liprochromes" or "lutein"; and Professor Leroy Palmer, who examined the blood in Head and Johnson's case, points out that carotin is normally present in the blood. The interest of obvious carotinaemia is its dietetic origin and the possibility of its confusion with morbid conditions.

The agreeable custom of holding occasional social evenings was resumed on October 31st by the Royal Society of Medicine. There was a large attendance of Fellows and their friends, who were received in the library at No. 1, Wimpole Street, by the President, Sir John Bland-Sutton and Lady Bland-Sutton. The proceedings were quite informal. Some of the treasures of the library were on view and light music was played by a string orchestra. At 9 o'clock a short discourse was given in the Barnes Hall by the President, who applied his gift of clear language to the task of making choroid plexuses and psammomata interesting to a large audience, partly medical and partly lay. The success of the evening's entertainment leads us to hope that further informal soirées will be arranged during this and future sessions of the Society. The opportunities for social intercourse might well be increased in the medical circles of the metropolis.

[1] G. D. Head and R. A. Johnson: *Arch. Int. Med.*, Chicago, 1921, xxviii, 268-275.

Medical Notes in Parliament.

[From our Parliamentary Correspondent.]

Voluntary Hospital Committees.

Mr. James Wilson asked, on October 26th, what steps, if any, had been taken to secure the representation of industrial workers as representative of the class largely using the hospitals, on the Voluntary Hospital Committees which were being set up in connexion with the Hospitals Commission appointed to distribute the parliamentary grant to voluntary hospitals; whether officials of the Ministry of Health associated with the administration of the Poor Law had been asked to supply the names of persons for nomination to these committees; and if so, why the Hospitals Commission, or the Ministry of Health, had relied upon Poor Law officers to secure nominations.

Sir A. Mond said his information was that the object of the Hospitals Commission was to secure that the local Hospital Committees should include all types of experience able to contribute towards the solution of the financial and administrative problems with which these committees have to deal. Members were appointed by county councils, county borough councils, the hospitals, the medical profession, and the Commission. The members of these committees appointed by the Commission were intended to be selected for their personal qualifications and not as representing any particular interests. Suggestions had been invited from various sources, including the General Inspectors of the Ministry; and the Commission would be glad to consider any suggestions from representative labour organizations, or any similar sources.

Voluntary Hospitals Grant.

Mr. Lyle asked, on October 31st, if the Government still adhered to its promise arising out of the Cave Committee's Report to allocate £500,000 to the voluntary hospitals; what steps in that case had been taken towards the allocation of the fund; within what period it was intended to be allocated; and whether in each case a stipulation was to be attached to the effect that before a hospital could receive a grant it must put up a sum equal to the grant to be made up of new money.

Sir A. Mond said that the grant of £500,000 towards the liquidation of the voluntary hospital deficit was voted by the House last August. The Voluntary Hospitals Commission were taking steps to establish Local Hospitals Committees on the lines recommended in Lord Cave's report, and it was hoped that the personnel of a number of these committees would be complete within the next few weeks. King Edward's Fund, which acted as the local committee for London, had made considerable progress with its work, and emergency grants would be distributed at an early date to the most necessitous of the metropolitan hospitals. He was informed that it was not anticipated that the full amount of the grant would be spent during the current financial year, and an estimate would be submitted to the House next session for a re-vote of the unexpended balance. As regards the conditions attaching to the grant, the Minister referred Mr. Lyle to the White Paper (Cmd. 1402) circulated in July.

Insurance Medical Records.

Sir J. D. Rees asked, on October 27th, whether the decision that doctors under the National Insurance Act should keep elaborate records had been cancelled, and if not, whether it would now be cancelled in view of the cost of maintaining such records and to the objection generally entertained to bureaucratic registration and to the possible disclosure of incidents in the private life of patients concerned. Sir A. Mond replied that keeping records was one of the original conditions of the Insurance Medical Service; the present system was recommended in 1920 by a special committee, mainly consisting of medical men, among whom insurance practitioners were strongly represented. The initial cost had already been met, and the cost of maintenance was small. Resolutions were passed

respectively by the Annual Conferences of Panel Committees and of Insurance Committees as recently as a week ago in favour of the keeping of the records. In these circumstances he saw no reason for reversing the decision that records should be kept.

Regional Medical Officers.

Mr. Sugden asked, on October 27th, how many cases examined by regional medical officers had been referred to them by panel doctors for consultative reasons, and how many by friendly or approved societies, or by doctors for the purpose of deciding the fitness of patients to return to work. Sir A. Mond stated that the provision at present made in regard to the duties of the regional medical staff did not include the routine examination of cases of the kind referred to in the first part of the question. Approved societies and doctors were notified, when the service began in November, 1920, that for an experimental period incapacity references only would be accepted. The aggregate number of references from approved societies, doctors, and Insurance Committees on questions of doubt as to incapacity for work was 50,318 for the period November 1st, 1920, to October 1st, 1921.

In answer to Mr. Sugden, Sir A. Mond gave the following particulars of the cost of the regional medical service:

	£	s.	d.
Salaries:			
Full time medical officers	41,918	6	3
Fees to part time officers	58	16	0
Travelling expenses:			
Officers and clerks	4,572	13	5
Insured persons...	645	12	5
Rent:			
Offices	2,001	0	0
Part time examination centres and women attendants	2,202	9	4
Clerical assistance	7,689	0	0
Incidental expenses (equipments, etc.)	819	18	6
	£59,508	15	11

Scottish Nurses' Registration.

Lieut.-Colonel Henderson, on October 25th, moved an address to His Majesty for modification of the draft rules of the General Nursing Council for Scotland. The object of the several changes he proposed was to abolish the distinction under which nurses trained for dealing with persons suffering from infectious diseases are placed in a supplementary list instead of being included in the general list. After debate the motion was negatived.

National Insurance: Preservation of Benefits for Unemployed.—Sir Alfred Mond, on October 28th, moved the second reading of the bill which he said he had introduced to meet the case of a large number of persons who had been in the ambit of the National Health Insurance benefit for several years, but who, owing to prolonged unemployment, would fall out unless special provision were made. Sir A. Warren, on behalf of the approved friendly societies, hoped that the measure would have speedy passage. There were, he said, men under national insurance who had been paying contributions for anything up to nine years, who had had practically no benefit, and who, unless some provision were made for them, would forfeit all they had paid during that period by falling into such a state of arrear as not to be qualified for benefit. The bill was read a second time.

Tuberculosis Cases: Pensions Appeals.—Colonel Gibbs, on October 26th, informed Mr. J. Guest that the Pensions Appeal Tribunals do not keep any record of the disabilities from which appellants suffer, and therefore could not say how many cases of appeal by ex-service men had been dealt with by the Lords' Tribunal.

Holloway and Brixton Prisons.—Mr. Shortt, on question by Sir S. Hoare on October 27th, stated that the Voluntary Nursing Board for Holloway Prison consisted of the Medical Commissioner (chairman), Dame Sarah Swift, Miss Hogg (Matron of Guy's Hospital), Miss McIntosh (Matron of St. Bartholomew's Hospital), Jessie Lady Camoys, Dr. Mary Scharlieb, Miss Edith Blunt, the Governor of Holloway Prison, and the Hospital Lady Superintendent of Holloway Prison. It was not the case that a wardress with no nursing experience had been placed in charge of the hospital at Holloway for persons convicted. The officer selected had had much nursing experience, having been engaged in hospital duties for seventeen years, and since 1913 she had been wholly employed on hospital work; she was reported by the medical officers to be fully qualified and very capable. The Voluntary Nursing Board had not been consulted on the appointment, nor had they made any representation in regard to it.

Ophthalmia Neonatorum.—In answer to a question, on October 26th, Sir Alfred Mond said he was aware that loss of eyesight had resulted from neglect of ophthalmia neonatorum. The disease was made compulsorily notifiable throughout England and Wales from April 1st, 1914. Skilled treatment for notified cases was now very generally provided in connexion with schemes for maternity and child welfare, and he was advised that the damage to sight caused by the disease was generally admitted to have been much reduced.

Infantile Mortality.—In reply to Dr. Addison, on October 26th, Sir Alfred Mond gave the following returns of the Registrar-General for each quarter of the present year to the end of September of the comparative numbers of deaths of infants:

Deaths under 1 per 1,000 Births (1921):

	London.	England and Wales.
First quarter	85	101
Second quarter	59	67
Third quarter	93	83

The excess of the London rate over the rate for England and Wales in the third quarter was, he stated, mainly due to infantile diarrhoea, which had, of course, a heavier incidence in towns than in the country as a whole.

Venereal Diseases Treatment.—Mr. Allen Parkinson asked, on October 27th, whether the Minister of Health had received repeated complaints from the Metropolitan Asylums Board with reference to the home at Sheffield Street for the cure of venereal disease; whether, at the request of the Board, he promised that a conference should be held last September; and what action he proposed to take. Sir A. Mond said that the answer to the first part of the question was in the negative. Last August he received a report from the Metropolitan Asylums Board drawing attention to certain difficulties which had been experienced in connexion with this institution, and requesting that arrangements should be made for a conference on the subject. It was hoped that this conference would take place in September, but this was found impracticable, and arrangements had now been made for it to be held early next month.

Post Office Medical Appointments.—Sir Walter de Frece, on October 19th, asked if, in making any appointment of a medical officer to the Post Office, the Postmaster-General would ensure that preference was given in every case to applicants who had served in the war; and in how many cases of recent appointments this had not been done. Mr. Kellaway replied that regard was paid to service with the forces, but consideration had also to be given to other factors, such as professional qualifications and the length of residence in the district. No records were available to enable a reply to the second part of the question.

Aged Workers' Health Insurance.—In reply to Mr. David Davies, on October 20th, the Minister of Health said that insured persons who remained in employment up to or after the age of 70 were already entitled to medical benefit for the rest of their lives. The extension of the right to sickness and disablement benefits to persons over 70 would require an increase of the weekly contributions, and would present serious administrative difficulties to approved societies in the application of the test of incapacity to work. In view of these considerations, and of the provisions of the Old Age Pensions Acts, legislation such as was suggested was not contemplated.

Clinical Thermometers.—Mr. Kiley asked, on October 24th, whether in the case of a person purchasing a clinical thermometer, and not being content with the maker's guarantee and desiring to have the instrument tested, it was possible for it to be taken to the National Laboratory at Kew and tested at a small cost. Mr. Baldwin replied that single clinical thermometers could be tested at the National Physical Laboratory at a fee of 1s. 6d.; the fee when large quantities were submitted was 3d. per instrument. This arrangement had been in existence for several years. Mr. Hailwood asked whether the President of the Board of Trade was aware of the inaccuracy of a large percentage of clinical thermometers, and whether he would take steps to introduce some method of test and certificate of correctness. Mr. Baldwin replied that the matter could be dealt with only by legislation, and he hoped to reintroduce a bill next session. He was glad that in the meantime most British manufacturers were voluntarily having their products tested at the National Physical Laboratory.

Registration of Herbalists.—Sir A. Mond answered in the negative an inquiry by Lieut. Commander Kenworthy, on October 27th, whether the Government contemplated any step for the better regulation and registration of herbalists on the lines of the recent Dentists Act.

Swine Fever Serum.—Dr. Murray asked, on October 31st, whether a quantity of serum urgently required for the treatment of swine fever arrived in England on September 13th, but owing to the effect of the Reparations Act was not obtainable until October 21st, and whether consequently serious loss had occurred. Sir Robert Horne was unaware of the alleged occurrence, but promised to make further inquiries.

Answers in Brief.

The consumption of beer in standard barrels and of spirits in proof gallons for the years ended March 31st, 1919-20-21, was as follows:

	1919.	1920.	1921.
Beer—standard barrels	12,721,000	24,757,000	26,284,000
Spirits—proof gallons	15,591,000	24,267,000	20,162,000

The Chancellor of the Exchequer proposes to declare Tuesday, December 27th, this year, a bank holiday for England and Wales.

THE PEKING UNION MEDICAL COLLEGE.

Opening of the New Rockefeller Building.

Among the countries which have benefited by Mr. Rockefeller's munificence China is one of the chief. The China Medical Board of the Foundation has concentrated its main efforts on the splendid new College which was opened on September 19th by Mr. J. D. Rockefeller, junr., who was accompanied by a number of leading American and European medical educationalists, including Sir William Smyly of Dublin, Dr. R. T. Leiper of the London School of Tropical Medicine, and Dr. T. Cochrane, formerly Principal of the Union Medical College, Peking, Drs. W. H. Welch, G. E. de Schweinitz, J. G. Clark, S. S. Goldwater and R. T. Pearce from America, Professor Tuffier from France, Drs. S. Hata, Shiga, and Nugoya from Japan, Professor Kenelm Digby from Hong Kong, and Dr. de Waart from Java.

Advantage was taken of the occasion to hold a medical conference and to invite the Chinese authorities and foreign public to visit the college and realize the completeness of the buildings and equipment. The Chinese Government was represented at the opening ceremony by the Minister of Foreign Affairs and by members of the Ministries of the Interior and of Education; among others present were Dr. S. P. Chen, President of the Central Hospital, and Mr. Roger S. Green, resident director of the China Medical Board.

Fig. 1.—Entrance Gateway.

China is far behind every other civilized country in the regard paid to public health. In the disturbed political conditions now prevailing throughout the country the lack of education (over 90 per cent. of the people being neither able to read or write), a depleted Treasury and many other pressing problems, the prospects for the development of public health work on a large scale are far from encouraging. A second difficulty lies in the fact that confidence in scientific medicine is not sufficiently widespread to ensure

Fig. 2.—Main Courtyard, showing Anatomy and Chemistry Buildings.

the co-operation on the part of the people that would be necessary for the most effective work. Furthermore, it is clear that while much of preventive medicine as it is known in the West could immediately be applied to China, the conditions to be dealt with, whether biological, social, or economic, are so different from those in the West that it is important that any large effort in public health work should be preceded by a period of careful study of local conditions in order that the measures undertaken may be adapted to them.

The problem of medical education was therefore indicated as that which first demanded attention, and the China Medical Board has accordingly settled on the following lines of activity:

1. Pre-medical education: A three years' course of preparation in physics, chemistry, biology, English, and Chinese; also either French or German.
2. Medical education: A five years' course, including one year of interne service or special work in the laboratories.
3. Facilities for graduate study to Chinese and foreign doctors.
4. Medical research, especially with reference to problems of the Far East.
5. Diffusion among the Chinese people of a knowledge of modern medicine and public health.
6. A training school for nurses, offering a four years' course in nursing to women students and facilities for graduate study.

The most important undertaking of the China Medical Board (which has now been at work for seven years) has been the reorganization of the Peking Union Medical College; this has included the gathering together of a large staff of teachers, nurses, and administrative officers, recruited from America, England, and Canada, from medical missions in China, and from foreign-trained Chinese. The staff now includes 15 pre-medical teachers, 57 teachers in the medical school, 31 nurses, and 48 administrative and technical officers. Of these, 123 are foreigners and 23 Chinese educated abroad. During the past year there were thirteen regular students in the medical school and fifty-nine in the pre-medical school.

Special post-graduate courses have been inaugurated for foreign and Chinese doctors, and during the year twelve Chinese and ten foreign doctors and seven Chinese and eleven foreign special students attended post-graduate courses in the medical school for various periods.

Worthy of note in the work of the college is the nurses' training school, which hopes to give to Chinese young women an education in nursing comparable to that offered

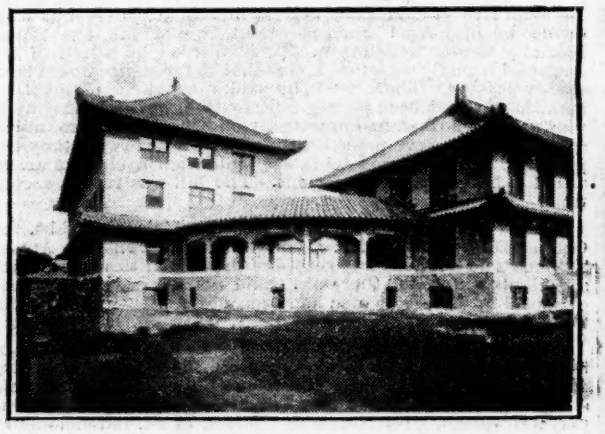


Fig. 3.—Covered curved corridor connecting Anatomy and Chemistry Buildings.

in the best hospitals at home and in America. Middle school graduation, or its equivalent, and a working knowledge of English are required for admission to the four-year course. The first year is devoted to work in the classroom and laboratory, and includes science courses in the pre-medical school. In the remaining years practical work in the wards is combined with instruction in theory. The aim is to turn out nurses who will be prepared to take positions of responsibility in teaching and in other hospitals on an equality with nurses trained abroad. The nurses' school has hitherto been used chiefly for training men, but will in future be closed to them. The teaching arrangements provide for twenty-five nurse pupils.

While devoting its energies and its resources mainly to

the Peking school, the Board has been much interested also in the development of other institutions. In particular, grants have been made to the Hunan-Yale College of Medicine and to Shantung Christian University. Small grants have also been made to the Pennsylvania Medical School of St. John's University, Shanghai, and to the National Medical College and Government school in Peking. In many cases the China Medical Board has given fellowships to teachers in medical schools other than the Peking College in order to enable them to carry on systematic study in their respective departments during their furlough years. In addition the Board has distributed contributions to over thirty mission hospitals in support of additional staff, general maintenance expenses, and improvements in buildings and equipment. The policy has been to aid first those hospitals near the principal medical schools to improve the relationship between them and the schools.

Such, in brief, are the main outlines of the work of the Rockefeller Foundation during recent years in China. It has set itself out to foster a high standard of medical education and professional ethics, and there is every prospect, when regard is paid to the thorough way in which each step forward has hitherto been accomplished, that the cause of scientific medicine in this country will receive from now onwards a very considerable impetus, and that we can look forward with confidence to the establishment in China of a medical profession on modern Western lines.

That the China Medical Board has not closed its doors against the admission of British graduates as teachers is shown by the fact that the staff already appointed includes six English and Canadian professors and associate professors. It is to be hoped that in future British teaching representation may be in yet greater proportion. There are ninety Americans and fifteen foreign-trained Chinese in the Faculty Board of the college.

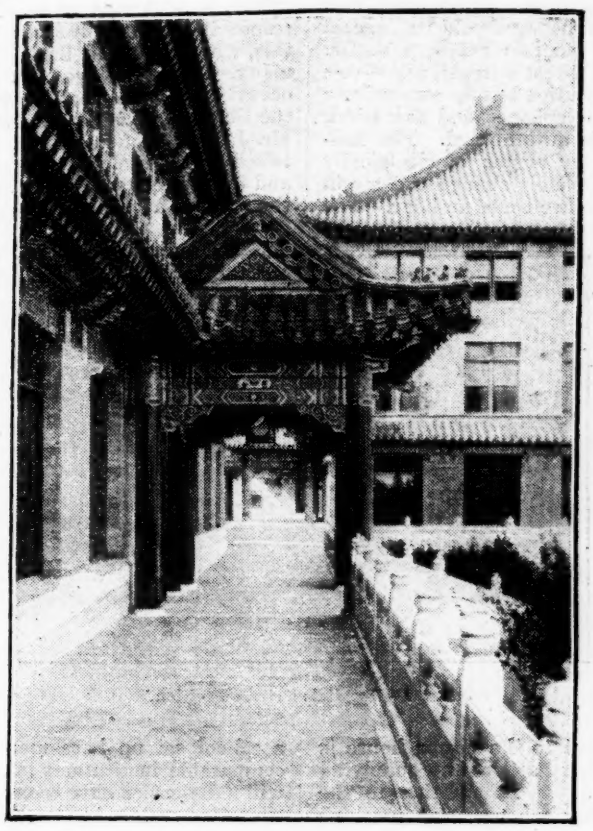


FIG. 4.—Porch of Chemistry Building.

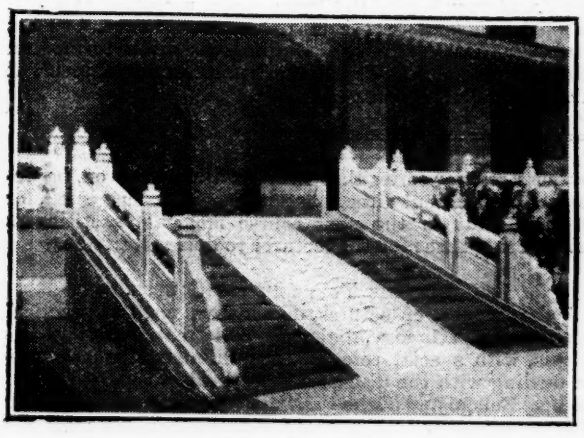


FIG. 5.—Staircase leading to Chemistry Building.

The College and Hospital.

The main buildings of the college—the departments of chemistry, anatomy, and physiology—are grouped on three sides of a courtyard and are linked at the back by curved open corridors. The buildings are of grey stone with green tiled roofs, and the courtyard is entered by an ornate gateway. A tribute to the *genius loci* is paid in the design of the staircases leading up to the physiology and chemistry departments; as will be seen, the centre of the staircase is filled by ornate carving to deter spirits from mounting, and should they still persist in the attempt to enter the building they are again baffled by the fact that the doorway is in the middle. The courtyard has polished marble paths, the whole effect of the exterior of the college is brilliant, and even dazzling, and the details of the ornamentation in Chinese style are very elaborate; but the laboratory accommodation and the interior is of the ordinary simple European type. As will be seen from one of the illustrations the porch of this building, as is that of the physiological department, is lavishly carved and painted.

Behind the college is the hospital, consisting of surgical and medical blocks, an out-patient department, wards for private patients, an administrative block, and a nurses' home. The hospital contains 235 beds. The department of pathology is on the same site and is connected with the out-patient department and the medical block.

Separated from the college and hospital by the Japanese club, school, and hospital is the pre-medical school for chemistry, physics, biology, and languages; there is a hostel for students on this site and at a short distance are two compounds containing villages in the English style, providing quarters for the staff. Facing the main entrance to the college is an auditorium and chapel.

The general style of the building may be judged from a photograph of the private block hospital which is reproduced.

FIG. 6.—Interior of Physiological Laboratory.

The Physical Plant.

It may be interesting, in order to give some idea of the completeness and modernness of the physical setting of this institution, to give a few facts concerning the plant.

The mechanical installation consists of four 250-h.p. Babcock and Wilcox boilers, equivalent to 1,000 h.p.,

which supply steam power and heat throughout the college and hospital. The electric generators, furnishing light and power, have a capacity of 375 kilowatts.

Pure distilled iced drinking water is available all through the buildings, and hot and cold water is furnished directly from the engine room. Refrigeration and electrically-controlled hot rooms are distributed throughout, and each laboratory is supplied with hot and cold water, coal gas, compressed air, low and medium pressure steam, 110-volt direct current, 220-volt direct current, and 4-volt experimental currents. The institution has its own private telephone exchange, with 200 telephones and ten trunk lines connected with the outside switchboard. The hospital buildings are ventilated by means of electrically driven exhaust fans, which completely change the air in each of the rooms from three to five times an hour. The main out-patient building is also supplied with water-filtered air.

Adequate sewage systems are provided. Sewage is pumped from the third section of the septic tank to the main city sewers by automatically controlled pumps. Garbage and refuse is disposed of through an incinerator. There is a modern laundry where at present 3,000 pieces are washed daily by rotary electrically driven washing machines. After passing through the soap-mixing tank and being washed, the clothes are passed through an extractor, which by its centrifugal motion at 947 revolutions a minute forces all water out of the clothes.

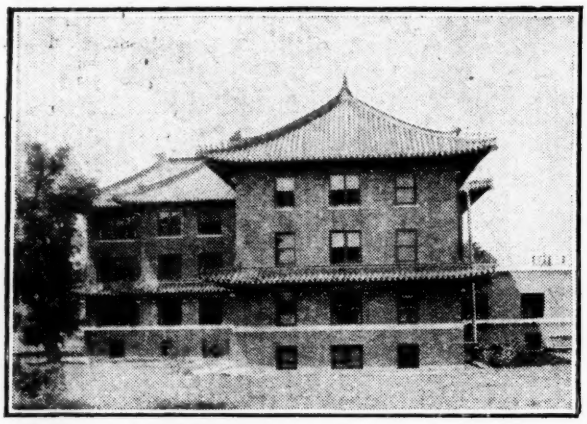


FIG. 7.—Hospital: Private Pavilion.

In the industrial group adjacent to the power house is located the coal-gas plant, which is at present supplying 20,000 cubic feet of gas per day. In addition to the carpentry and paint houses there is a precision machine shop and a complete electro-plating shop in this group.

The nitrous oxide plant has a capacity adequate to meet the demands for operating-room use. Nitrous oxide and oxygen are pumped direct to the main operating rooms.

The average daily consumption of coal in the power house is 25 tons. The emergency fire pump has a capacity of 1,000 gallons per minute. The hot water circulating pump can supply 30,000 gallons per day at a temperature of 153° F., and the boiler feed water pump furnishes hot water to the boilers at a rate of 1,600 gallons per hour. The ammonia compressors have a capacity of 16 tons of refrigeration each. A brine circulating pump of a capacity of 150 gallons per minute supplies refrigeration to 61 ice boxes, and can also make 9,000 lb. of ice (from distilled water) in sixty hours.

In the floors (comprising cement, terazzo, vitreous tile, marble and wood floors), window glass and tiled walls, the grand total area of surface to be cleaned is 530,654 square feet.

The Danger of Extravagant Expenditure.

Up to the present time the Foundation has spent over 10,000,000 dols. on the college and hospital, and the annual upkeep is estimated to cost 1,000,000 dols. or more. The responsibilities involved in such a great undertaking as this, where new soil has to be broken at every turn, are many, and advantage has therefore been taken of the occasion of the official opening to hold daily meetings of the Board of Trustees of the Foundation, who, headed by Mr. J. D. Rockefeller, junr., have visited Peking specially to see for themselves the practical outcome of their scheme and to discuss questions of financing and general policy on the spot. At the dedication ceremony Mr. Rockefeller spoke of the aims and aspirations of the Foundation, and threw out a word of caution, showing that the great expense entailed in an elaborate modern installation in such palatial buildings had not been passed unnoticed. He said, "In order that one of the foremost objects of the China Medical Board in building up the Peking Union Medical College may be attained, namely, that the College may serve to stimulate the development by the Chinese people of similar institutions, it is essential that the current cost of operating should always be kept on a conservative level. If a policy other than this is followed, and a school set up here more expensive to maintain than comparable institutions in America and Europe, not only will a disservice have been rendered to the cause of medical education and hospital development throughout the world, but the Chinese people will not be so ready to undertake the creation and maintenance of similar institutions in other parts of the Chinese Republic."

In some quarters this point has been regarded with some misgiving, as it has been felt that the college has placed itself on too high a pedestal. This is a matter which will, no doubt, right itself in time.

The Chinese authorities of the Central Government, as well as the Ministers of the Diplomatic Corps and various public bodies, have vied with each other to show the visitors every courtesy, and the President of the Republic, His Excellency Hsu Shih Chang, gave a reception, at which he spoke in laudatory terms of the much-needed benefits that China would receive in the impetus given to modern scientific medicine and public health reform as a result of Mr. Rockefeller's great generosity.

England and Wales.

POST-GRADUATE COURSES IN WILTSHIRE.

THERE has just been concluded at Trowbridge, Wiltshire, the first course of post-graduate lectures arranged there by Bristol University, and a similar course is now being conducted at Swindon for the northern portion of the county. The attendance at the Trowbridge course was good and the lectures were greatly appreciated by the medical practitioners of the district. The subjects chosen were admirably suited to the needs of general practitioners, and included demonstrations on fractures of the lower limbs, general principles and non-operative methods, by Mr. E. W. Hey Groves; modern methods of treatment of fractures of the jaw and upper limb, by Mr. A. Rendle Short; vaccine therapy and the use of curative vaccines, by Professor Walker Hall (two lectures); the etiology of cardiac diseases and disorders, by Dr. Carey Coombs; and the physiology of the heart beat and cardiac disorders, by Dr. C. E. K. Herapath. The courses are intended to be the first of a regular series that may, as time goes on, be developed in different directions; it has been suggested, for instance, that in the next course medical practitioners should bring cases for the lecturer to demonstrate on.

CAMBRIDGE TUBERCULOSIS COURSE.

A short course of lectures, demonstrations, and practical work on the pathology, diagnosis, and treatment of tuberculosis, with special reference to administrative measures for dealing with the disease, will be held at the Cambridge Medical School and at the Papworth Colony from November 14th to December 17th, should a sufficient number of names be received. The classes will be given as follows: Bacteriology of tuberculosis, Dr. Louis Cobbett; Morbid anatomy and histology, Sir G. S. Woodhead and Dr. Strangeways; Surgical tuberculosis, Mr. Joseph Griffiths; Psychology of tuberculosis: working capacity, fatigue, effect of environment, Dr. W. H. R. Rivers, F.R.S.; Pulmonary tuberculosis: (*a*) diagnosis, treatment, and prognosis, (*b*) administrative and clinical work at Papworth, Dr. Varrier-Jones and Dr. Paton Philip. The matriculation fee is £1 15s.; the fee for the course, including one week's

board and lodging at Papworth, is £15 15s. Further particulars may be had from Dr. P. C. Varrier-Jones, Papworth, Cambs.

Payments by Hospital Patients.

The almoner's report presented to the half-yearly meeting of the Board of the Bristol Royal Infirmary on October 13th contains some observations well worthy of consideration by those who are promoting what is commonly spoken of as the Sussex Provident Scheme. The almoner reports that of all the patients admitted to the institution only one in five was able to pay the very modest contribution for maintenance which is asked for. Upon this the *Bristol Medico-Chirurgical Journal* makes the following comments:

"From this observation, based on most careful inquiry by an experienced officer well qualified to judge, but one conclusion can be drawn—namely, that the payments by patients will not materially reduce the expenses of the infirmary so long as it continues to provide for the wants of the really necessitous persons for whom the charity was founded and for whom it has hitherto been maintained. The governors are now confronted with the serious question whether sufficient voluntary contributions will be forthcoming from the more affluent members of the community, or whether they will be compelled to close their beds to the poor and divert the institution from its original purpose, admitting principally or solely those who can pay for admission. It would be intolerable if 'ability to pay' should be the passport into our voluntary hospitals. The public, we venture to think, is unaware of the amount of distress in our midst. There is an impression abroad that wages are high and that all classes enjoy a fair measure of prosperity, so that the claims of charity are less pressing. The report shows how erroneous this impression is. Funds are urgently needed, and no scheme for payment by patients is going to solve the difficulty of those who through ill-health have fallen into poverty. Unless voluntary contributions are more freely forthcoming the hospitals of our city will not be able to continue their mission for those whose needs are greatest. Hard times are at hand, when it becomes the more incumbent on us to show unwearied mercifulness touching the care of the poor. We must each and all unlock the treasury of our charity to its fullest extent, so that after the example of generations past we may discharge our just debts of benevolence."

Somerset Panel Practitioners.

On October 14th a large number of doctors practising in the county of Somerset attended a complimentary luncheon at Weston-super-Mare in honour of two of their colleagues. As chairman and honorary secretary respectively of the Somerset Panel Committee Dr. John Wallace, O.B.E. (M.O.H. for Weston), and Mr. C. P. Crouch, F.R.C.S., have earned the gratitude and won the esteem of all the panel practitioners in Somerset. This complimentary luncheon was given by their colleagues, past and present, on the Somerset Panel Committee. The chair was taken by Dr. H. C. Bristowe (Wrington), while among the guests were Mr. A. Imber (chairman of the Somerset Insurance Committee), Mr. S. W. Robbins (clerk to the Committee), and Dr. Bertram Rogers (regional medical officer). Apart from the opportunities the luncheon offered for the expression of deep regret that Dr. Wallace and Mr. Crouch were retiring from their offices as chairman and secretary of the Somerset Panel Committee, warm tributes were paid to the ability with which they had helped to make the Insurance Act run smoothly in the county. The success which has attended their labours was fully demonstrated by the presence of the chairman and clerk of the Insurance Committee, and by the cordial tone of their speeches. From Mr. Crouch's remarks it is evident that the Insurance Act has worked well in "the straggling, rather awkward, difficult of access, beautiful county of Somerset," and, moreover, has done something to bring the medical profession together in mutual agreement and friendship.

Warneford Hospital, Leamington.

Princess Helena Victoria opened, on October 26th, the new out-patient department of the Warneford and South Warwickshire General Hospital, Leamington Spa, which has been erected at a cost of £25,000. Dr. Bernard Rice stated that last year there were 37,000 attendances in the out-patient department, but like most other hospitals the expenses exceeded the income; they were losing about £2,000 a year. The committee, however, felt it desirable to maintain the hospital in a position it had held for ninety years as a voluntary hospital. Princess Helena, in declaring the new building open, expressed the real pleasure it gave her to be present on the occasion, and she wished the hospital every success. At a subsequent reception purses containing gifts to the reconstruction fund amounting to £2,500 were received.

Birmingham University Medical Society.

Past members of the Birmingham Medical School will be interested to hear of the vigorous revival of the Birmingham University Medical Society, which now incorporates the former Queen's College Medical Society. The forty-first annual meeting was held in the Founder's Room of the University Club on October 26th, and was attended by a large number of graduate and undergraduate members. The following officers were elected for the ensuing year: President, Dr. Laurence Ball; Vice-President, Dr. Leonard Parsons; Honorary Treasurers, Mr. Leather and Mr. Lowe; Honorary Secretaries, Dr. Abrahams and Mr. F. Stammers. The following members of the Council were appointed: Graduates, Drs. K. D. Wilkinson, A. P. Thomson, and E. W. Jones; Undergraduates, Messrs. Ainscow, Beckenn, Carr, Gould, Prior, and Savage. The retiring President, Mr. Seymour Barling, C.M.G., F.R.C.S., delivered his valedictory address on "The early days of surgery." The address was a most interesting exposition of the evolution of surgery from its earliest days. It was pointed with wit and wisdom, and was received with well-merited enthusiasm. The meeting closed with a special vote of thanks to Mr. J. A. Ainscow for his energetic work on behalf of the society during the past session.

Scotland.

Centenary of Edinburgh Medico-Chirurgical Society.

The centenary dinner of the Medico-Chirurgical Society of Edinburgh was held on October 28th, in the hall of the Royal College of Surgeons, when a distinguished company, numbering over a hundred, assembled under the presidency of Emeritus Professor Caird, President of the Society. After the loyal toasts had been proposed and duly honoured, Sir John Bland-Sutton proposed the toast of "The Medico-Chirurgical Society of Edinburgh." He read a congratulatory message from the Royal Society of Medicine—of which he is President—and said that he knew well the excellent work the Edinburgh Medico-Chirurgical Society had done, as for the last thirty years he had been a regular reader of its *Transactions*. He referred to the great progress that had been made in medicine and surgery during the last hundred years. Many of the specialities which now abounded in medicine—for there were no fewer than twenty-five sections of the Royal Society of Medicine—had been due to the invention of clever and cunning instruments. To his mind there was less difficulty in establishing a speciality than in mapping out its sphere of influence. In regard to the alimentary canal, for instance, there was a certain class of surgeons who devoted their attention to the mouth, but their position was contested by the dentists, who called themselves odontologists. Then, when a new instrument had been invented for investigating the oesophagus, specialists in this subject formed a society and were now running a periodical. In spite of all these clever instruments eminence in science, or even ordinary success in surgery, would remain in the future as in the past, based on a sound clinical experience on the rock of pathology. Emeritus Professor Caird, in reply, said that the society was founded by a certain Robert Hamilton, who sent a round robin to the medical profession in Edinburgh, which testified approval of the objects of the Medico-Chirurgical Society in London and willingness to co-operate in the formation of a similar society in Edinburgh. This link between the south and the north would never be broken. From south of the Tweed Edinburgh had received honoured men like Laycock, William Turner, Greenfield, and Byrom Bramwell; but the greatest of all these was Lister. The first president of the society was Andrew Duncan, senr., the second was Sir James Young Simpson, and the third was the immortal Lister. During the last hundred years the meetings of the society had proved a mirror of the events passing in the world around them. Dr. George Mackay, in proposing the toast of "Sister Societies," said that he

had found that the Royal Society of Edinburgh dated from 1783, the Royal Medico-Chirurgical Society of Glasgow celebrated its centenary in 1914, while the Royal Medical Society was founded in 1737, and obtained its charter in 1778. It was with a feeling of gratitude towards these societies, which had been leaders in the cause of science, that he proposed this toast. Professor Bower, President of the Royal Society of Edinburgh, said, in reply, that the foundation of the society to whose hospitality they were indebted followed shortly after the Napoleonic disturbances, and the interesting question arose what new societies would arise in the near future after the gigantic disturbances they had just gone through. Dr. W. K. Hunter responded on behalf of the Royal Medico-Chirurgical Society of Glasgow, and Dr. Davidson, Senior President of the Royal Medical Society of Edinburgh, also replied. Dr. Freeland Fergus (Glasgow) proposed the toast of "The President," paying a high tribute to the Edinburgh medical school, and the Chairman made a suitable response.

Foreign Service Club.

The third annual meeting of the West of Scotland Foreign Service Medical Club was held in the Grosvenor Restaurant, Glasgow, on the evening of October 28th. The reports submitted were eminently satisfactory, the membership having increased since last year to 210, and the credit balance in hand to £121. Office-bearers were appointed as follows:—President: James Livingstone Loudon, M.D., T.D.; Vice-President: F. V. Adams, F.R.F.P.S.G., T.D.; Honorary Secretary and Treasurer: David Shannon, M.B. Thereafter the members dined together, the company numbering 134. The President, Mr. Thomas Kay, D.S.O., M.B., T.D., occupied the chair, and, as guests of the club, there were present Major-General Sir Philip R. Robertson, K.C.B., General Officer Commanding the 52nd (Lowland) Division; Colonel R. J. Blackham, C.B., C.M.G., Dublin; Dr. Charles E. Douglas, President of the corresponding society in the East of Scotland, and also its Secretary, Dr. James Young, D.S.O. The gathering was a very representative one, and its enthusiasm augured well for the continued success of the club.

The Glasgow Southern Medical Society.

The Glasgow Southern Medical Society held its opening meeting on October 13th, 1921, when there was a large attendance, and the President, Dr. John Paton, delivered an address in which he dealt in a very interesting and racy manner with his experiences at home and abroad during the great war. He touched upon a large variety of topics including the psychological reactions of the community to war conditions, the evolution of the treatment of wounds, and the after-results of the war as they appear to the general practitioner.

Royal Faculty of Physicians and Surgeons, Glasgow.

The annual dinner of this Faculty—the first since 1914—was held in the Faculty Hall, Glasgow, on the evening of October 21st. The chair was taken by the President, Dr. A. Freeland Fergus. The company numbered about 70, and a number of representative guests were present, amongst them being Principal Sir Donald MacAlister, K.C.B., and Professor E. P. Cathcart, M.D., from Glasgow University; Bailie John Smith, and Lord Dean of Guild Sir John Reid, K.B.E., from Glasgow Corporation; Dr. George Mackay, Dr. Harry Rainy, and Mr. Alex. Miles from the sister colleges in Edinburgh; Sheriff A. O. M. MacKenzie, and Colonel R. J. Blackham, C.B., C.M.G., A.M.S. A most enjoyable evening was spent, the after-dinner speaking, as is usual on such occasons, attaining a high standard of excellence.

Dr. John Macpherson.

Dr. John Macpherson has recently retired from the post of Medical Commissioner of the Board of Control for Scotland. Dr. Macpherson was educated at Edinburgh University, where he graduated M.B., C.M. in 1882, and was awarded a gold medal for his M.D. thesis in 1896. After being an assistant at the Royal Edinburgh Asylum, under Sir Thomas Clouston, he was in 1889 appointed medical superintendent of Stirling District Asylum at Larbert; he reorganized that institution, establishing a modern hospital block and a pathological department and laboratories for research. He published in 1899 a well known textbook on mental affections, and for many years he lectured in mental diseases in the School of Medicine of the Royal Colleges at Edinburgh; he is a Fellow of the Royal College of Physicians of Edinburgh, and represents that body on the Board of the Edinburgh Royal Infirmary. He was appointed Commissioner in Lunacy in 1899, and established a high reputation alike with public officials and the medical profession. In 1910 he was president of the Medico-Psychological Association of Great Britain and Ireland.

Memorial to Dr. T. F. McFarlane.

An Aberdeen granite pedestal with a cast bronze panel, erected by his patients and friends over the grave of Dr. Thomas Fraser McFarlane in the Western Cemetery, Dundee, was unveiled on October 13th. In addition to the monument, a cot has been endowed in the Dundee Royal Infirmary and in the Children's Hospital, Broughty, to perpetuate Dr. McFarlane's memory.

Correspondence.

PERNICIOUS ANAEMIA AND TOXIC ANAEMIA.

Sir,—In the interesting and important report of two cases of "pernicious anaemia" in the British Medical Journal of October 29th (p. 685) by Drs. Maynard and Sturton there is a distinct difference between Cases I and II. The first case showed a low colour index, and at autopsy only "some hyperplasia of the erythroblastic elements" of the marrow was observed in films. Is this case to be regarded as a true variety of the Addison-Biermer disease or should one not prefer to regard it as a secondary anaemia?

The second case, with marked poikilocytosis, extreme anisocytosis, and numerous megalocytes, is, apparently, a case of the disease as usually understood.

It would have been interesting to have a report on the condition of the cancellous bone of the medullary cavities of the long bones in the first case; the presence of active absorptive processes as described in detail by Marchand[1] can be regarded as excellent collateral evidence of the presence of pernicious anaemia.

I would venture to call the attention of the authors to the recent important experimental work on the etiology of pernicious anaemia by Winifred Ashby,[2] and would ask whether they would not make a distinction between true pernicious anaemia and toxic anaemia. It appears to me that neither of the cases as reported in your pages are identical with the pictures given by Combe or Addison, either from the clinical or the haematological aspect, and more recent work has only served to add sharpness to the descriptions of the older observers.—I am, etc.,

Birmingham, Oct. 29th. Alfred Piney, M.R.C.P.Lond.

"THE NEURASTHENIC ELEMENT IN MIDWIFERY AND GYNAECOLOGY."

Sir,—Dr. Farquhar Buzzard's parting shot at my conception at the Newcastle meeting (reported in the Journal of October 29th) needs, as my (unknown) neighbour at the meeting stated, a reply. In my remarks I had put forward the view that neurasthenia depends to some extent—and I think to a large extent—on a depressed intra-abdominal pressure. The discussion was closed by Dr. Buzzard, who in his last sentences said that I should no doubt feel a glow of satisfaction if he were to say that neurasthenia did not occur in pregnancy. But he was not going to say anything of the kind; on the contrary, if my view were correct, then every woman after childbirth—he stated—should become neurasthenic, and every woman who had twins, insane!

I do not know whether this repartee is the considered opinion of Dr. Buzzard; but I trust not, since a little examination will show how invalid is this criticism. But it is very plausible; and, since it may easily mislead, it

[1] Marchand, F.: Ueber Halisterese der Knochenbälkchen bei perniciöser Anämie, *Atti del 1° Congresso dei Patologi*, 1912, p. 283.
[2] Ashby, W.: Blood Destruction in Pernicious Anaemia, *Journ. of Exper. Med.*, 1921, vol. xxxiv, p. 147.

requires examination. Although many women become fanciful and erratic during pregnancy, this peculiar state, I believe, is for the most part limited to the first three months of pregnancy. On the other hand, we have the very common assertion, made by women, that they never feel better than when they are pregnant—a statement which refers to mid and late pregnancy. That neurasthenia in women is most often found in the non-pregnant state, and especially in women who have suffered from repeated parturitions and are physically weak, will, I think, be admitted. Further, we have, as your readers and Dr. Buzzard know very well, the association of pregnancy and the puerperal state with insanity. The interesting part is that (according to authorities—for instance, Savage, quoted by Dakin[1]) when insanity attacks a pregnant woman it does so during the first three months of pregnancy. We must therefore believe that when a neuropathic element is present the woman during the last six months of pregnancy is relatively immune from insanity.

Now, as I have shown elsewhere,[2] these two periods of pregnancy, in so far as the intra-abdominal pressure is concerned, are very different from each other. Whilst during the first three months there is reason for believing that the pressure within the abdomen may be actually less than in the normal non-pregnant, during the last six months of pregnancy (during the period in which the abdominal wall is stretched) the pressure can readily be shown to be greater. It is further to be noticed that even when insanity does occur during pregnancy it is always associated with a state of exhaustion and anaemia, and that tonics, not sedatives, afford the best treatment. But though insanity occurs during pregnancy, it is (according to the authority referred to) much more common in the puerperium—that is to say, when the intra-abdominal pressure becomes, or tends to become, greatly reduced as the result of emptying the uterus. In these cases, also, weakness and anaemia (the result of bleeding) seem necessary concomitants. Although sepsis, at least a mild sepsis, is sometimes or often present, this apparently as a rule is not the cause of the insanity, and from the etiological point of view can be excluded.

Coming now to the question as to why the healthy pregnant woman does not become neurasthenic or insane as the result of parturition, what do we find? Apart from the very common practice of midwives and nurses of fixing a binder tightly around the abdomen, which must tend to keep up the intra-abdominal pressure, we find that changes in the abdominal wall rapidly ensue. The stretched flank muscles begin to retract at once after birth, their fibres get shorter immediately, and continue to do so until an equilibrium is attained. Similarly, the separation of the recti, so conspicuous a result of pregnancy, immediately begins in women under advantageous conditions to get less; and this process goes on until the separation has quite disappeared. It is only in poorly nourished women, who cannot afford the necessary rest in bed, and are impelled to return to arduous household duties too soon, that this involution of the abdominal wall—at least as important as any other change common to the puerperium—does not occur, or remains incomplete. Such women are consequently left weak; and it is in them that neurasthenic changes most frequently appear. For a similar reason, one sees that when the pelvic floor musculature is seriously damaged by childbirth, even when a satisfactory involution of the abdominal wall has occurred (the result of the rest in bed), a weakness, at first physical but later mental, may show itself with the return to activity. The pelvic floor, being now unable to resist the pressures produced in the abdomen, leads the patient to desist from such movements as cause such pressures. Thus a lower pressure than normal comes to reign; and that sequence ensues by which in my remarks I explained the genesis of neurasthenia.—I am, etc.,

Rugby, Oct. 30th. R. H. PARAMORE, F.R.C.S.Eng.

METHODS OF ANAESTHESIA.

SIR,—I have just read with much interest the paper by Mr. H. E. G. Boyle, published in your issue of October 15th, 1921, on "Anaesthesia for nose, throat and abdominal surgery by the nitrous oxide–oxygen–C.E. combination." There are several points in it worthy of consideration, both by surgeon and anaesthetist.

First, Mr. Boyle's remarks on the preparation of the patient are most important. The "drastic treatment" "meted out" to so many patients prior to operation is little short of a surgical catastrophe, and must have weighed heavily in the balance against them.

Secondly, Mr. Boyle points out that every form of anaesthesia should aim at being "as little toxic as possible." This aim is frequently lost sight of; the provision of a safe and adequate anaesthesia too often bounds the anaesthetist's horizon, and toxic after-effects are apt to be accepted as inevitable in certain cases. In this connexion the work of Cotton, Mackenzie Wallis and Hewer mark one of the most important advances made in the science of anaesthesia. The preparation of ethanesal by Dr. Wallis is an attempt to produce by scientific methods a non-toxic inhalation anaesthetic, and though it may not quite come up to the ideal it is immeasurably ahead of anything we have had before. Future progress lies along this line of research, rather than in the devising of new ways and apparatus to give the older drugs.

Thirdly, Mr. Boyle uses as a relaxant with nitrous oxide and oxygen a mixture of equal parts chloroform and ethanesal. Here I join issue with him. That a relaxant is at times necessary in abdominal work under nitrous oxide and oxygen anyone with much experience will readily admit, but only in exceptional cases is chloroform necessary. Ether, or better, ethanesal, is all that is required to give adequate relaxation in these cases, provided the anaesthetist possesses the necessary skill and experience to avoid the asphyxial element. This being so, why introduce a toxic drug like chloroform as a routine? The same applies to throat and nose cases.

In my own practice I use simply air to which is added the vapour of ether or ethanesal, and have found it in every way adequate for maintaining anaesthesia in these cases. In very exceptional circumstances a little chloroform vapour may be added.

Mr. Boyle uses nitrous oxide and oxygen *plus* ether *plus* chloroform as a routine. My contention is that, save in exceptional cases, the chloroform is unnecessary: its use runs counter to the second of Mr. Boyle's postulates. In diathermy the conditions are quite different; here the ether is potentially more dangerous than the chloroform.

One final suggestion—if it is necessary to use chloroform and ether as a relaxant do not mix them; keep them in separate containers. A simple arrangement of taps will allow the anaesthetist to add any proportion of each he wishes to his nitrous oxide and oxygen or air stream.—I am, etc.,

Clifton, Bristol, Oct. 26th. STUART V. STOCK.

NATIONAL PROVIDENT HOSPITAL ORGANIZATION.

SIR,—It is now announced in the daily press that there is a great middle-class rush to enrol in the above scheme, through which hospital doctors are to be had for £1 a year. Four general hospitals in London are named as having joined in the scheme. As regards one of them—the Hampstead General and North-West London Hospital—it may be of interest to state that the Medical Committee, after careful consideration of the working arrangements (circular dated September, 1921) have informed the Board of Management of their unanimous decision that the members of the honorary medical and surgical staff are not prepared to take any part in the working of the scheme. A majority of the medical committees of the London general hospitals seem to have acted in the same way and to have been supported in their action by their governing boards. It is difficult to see how the medical staff of any hospital can retain the title of honorary and at the same time become the paid servants of a commercial insurance company which buys their time and services.—I am, etc.,

G. A. SUTHERLAND,
Senior Physician to the Hampstead General and North-West London Hospital.

October 30th.

SIR,—I have been instructed to make the position of the Brighton Division clear so far as it is referred to by Dr. Muir Smith under the above heading in the issue of the SUPPLEMENT for October 22nd. The Sussex Provident

[1] Dakin: *A Handbook of Midwifery*, 1897, p. 558.
[2] Paramore, "The Intra-abdominal Pressure in Pregnancy," *Journ. Obstet. and Gynaec. Brit. Emp.*, August and September, 1913; also *Proc. Roy. Soc. Med.*, Obstet. and Gyn. Sec., 1913.

Scheme has not been organized, nor was it promoted by the Division, nor has this Division any representative on its Organizing and Executive Committee. That committee is not a medical committee. This Division was asked whether it approved the original scheme, and after certain vital amendments had been made therein it did do so. It was decided to bring the scheme to the notice of the Representative Body, and in order to do this a competent resolution was placed on the agenda. (By an unfortunate error on my part, in this resolution the words "by Sussex" were sent up instead of "for Sussex.") This Division is in no way to be held responsible for the name selected for the scheme, nor for the bringing it into operation at the present date, nor for any circulars issued, nor for any action or want of action of its promoters in the past or in the future.—I am, etc.,

L. A. Parry,
October 29th. Honorary Secretary, Brighton Division.

Sir,—I venture to traverse some of the statements contained in Dr. Muir Smith's letter in the Supplement of October 22nd, in regard to what has been called "The Sussex Provident Scheme for Hospital and Specialized Medical Services." Incidentally the name "Sussex" as applied to the scheme arose in London and not in Brighton.

The following statements are not correct—namely, that the scheme "was framed by a few Brighton consultants," "is controlled by a small section of class practitioners—a Brighton caucus—."

Further, probably most people will disagree with Dr. Muir Smith when he states that a married couple with £400 a year, and a married couple and children with £500 a year, can afford the fees usually asked for such things as a bismuth meal, *x*-ray diagnosis, preparation of vaccines, *x*-ray treatment of recurrent nodules of carcinoma, laparotomies, or other major operations necessitating three weeks in a nursing home; nor is he correct in saying that some scheme to lighten these heavy expenses has never been urged or demanded.

The scheme, as must be evident to any one who will read its provisions and rules, is altruistic in origin and intention; and whether or no it will bring financial help to the hospitals, it will certainly not benefit the consultants; they are the only people who stand to lose by supporting it.

I have personally had no part in originating or working the scheme, though I have viewed it with interest.—I am, etc.,

Brighton, Oct. 27th. Robert Sanderson.

SANATORIUM BENEFIT.

Sir,—To Dr. J. D. Macfie's fourth question (October 22nd, p. 670): Should we adopt the army method of diagnosing tuberculosis by the presence of tubercle bacilli in the sputum? I would, as a general practitioner, return a qualified negative. The examination for the bacillus may occasionally settle the diagnosis in doubtful cases, but it is the abuse of the method that is to be deprecated. This has led in late years to an unscientific and even cowardly backing behind the finding of the bacteriologist at the expense of proper estimation of symptoms and physical signs. I see from time to time cases presenting these latter in such degree as to justify the diagnosis of phthisis, but not so called because the bacillus is absent when sought for.

Quite lately a case of chronic fibroid phthisis came to me in which I was able to locate two cavities; but it was labelled chronic bronchitis because the bacillus had not been found. She had attended a tuberculosis dispensary for two years, and had obtained treatment there (malt and oil) which, it is not much exaggeration to say, might as well have been carried out by the local grocer.

Again, it leads to one practitioner ousting another when the first expresses an adverse opinion. People do not like the diagnosis of tuberculosis, and often meet the opinion with "there is nothing of that sort about our family." The second practitioner is then called in and finds there is no "T.B.," thus vindicating the family pride.

Further, it leads to a mischievous waiting if the case is to be decided by the ultimate presence of the bacillus, when it is too late; the damage is done and valuable time has been lost. Finally, it tends to a neglect of physical signs, not to mention symptoms, when these unfortunately present themselves.—I am, etc.,

London, N.W., Oct. 31st. Hope Grant, F.R.C.S.Ed.

THE MEDICAL DEFENCE UNION.

Sir,—May I be allowed to correct a slight error in your otherwise admirable note in your last issue (p. 711) on the annual report of the Medical Defence Union?

The indemnity insurance scheme, which came into force on January 1st, 1921, does not involve an additional optional payment of a premium of 7s. 6d. to the insurance company, as stated by you. That was the case under the former arrangement when the annual subscription to the Union was 10s., but the indemnity insurance premium is now included in the increased annual subscription to the Union of £1, payable by every member.—I am, etc.,

James Neal,
General Secretary.
4, Trafalgar Square, London, W.C., Nov. 2nd.

Obituary.

F. A. BAINBRIDGE, M.A., M.D.Cantab., D.Sc.Lond., F.R.C.P., F.R.S.,

University Professor of Physiology, St. Bartholomew's Hospital.

It is with much regret that we learn of the death, on October 27th, after a short illness, of Professor F. A. Bainbridge.

Francis Arthur Bainbridge was born at Stockton-on-Tees in 1874. He was educated at the Leys School, Cambridge, and entered Trinity College in 1892. He took the first part of the Science Tripos in 1895 and the second part in 1896, obtaining a first class in each part, and was elected to a major scholarship at Trinity in 1896. He then proceeded to St. Bartholomew's Hospital, where, after holding the senior resident appointments, he was appointed junior demonstrator of physiology in 1900. In 1901 he took the M.B.Camb. and the M.R.C.P.Lond. while he was holding the posts of pathologist and bacteriologist at Great Ormond Street Hospital, and of junior demonstrator of pathology at St. Bartholomew's. In 1902 he was elected to a research scholarship of the British Medical Association. For two years before this he had employed all his spare time in carrying out research in the Physiological Laboratory of University College, devoting his attention specially to the physiology of lymph formation and of pancreatic secretion. In 1903 he was appointed casualty physician at St. Bartholomew's Hospital, an appointment which naturally diminished his opportunities of laboratory work, but he found time to take the Cambridge M.D. and the London D.Sc., being awarded the Horton-Smith prize for the thesis which he sent up for the former degree. In 1904 he held the post of demonstrator in pharmacology at St. Bartholomew's, continuing his experimental work at University College. In 1905 he was appointed Gordon lecturer on pathology at Guy's Hospital, a post which he held for two years, proceeding in 1907 to the Lister Institute, first as Jenner memorial student and later as assistant bacteriologist. During this time (1909) he was elected to the Fellowship of the Royal College of Physicians.

Although Bainbridge was a competent bacteriologist and carried out some valuable work on the influence of bacteria on proteins and on the paratyphoid group of bacteria—the subject which he chose for his Milroy lectures in 1912—his main interest was always in experimental physiology. He therefore welcomed the opportunity to return to experimental work afforded by the offer of the post of Professor of Physiology in Durham University at the Newcastle School of Medicine, the duties of which he took up in 1911. Here he entered with zest on the organization of his department and of the medical school, and found time to continue the work on the kidneys which he had begun while Gordon lecturer at Guy's Hospital. On the outbreak of war in 1914, he at once offered his services and received a temporary commission in the R.A.M.C., and was given charge of patients in a military hospital at Newcastle-on-Tyne. In 1915, however, he was appointed University Professor of Physiology at his old school, and for the following year

carried on the teaching at St. Bartholomew's, while at the same time working as captain, R.A.M.C., in the gas defence department, employing his time partly in researches into the action of toxic gases at Millbank, partly in travelling about the country to the various cadet training schools, giving instruction in the methods of defence against poison gases. The stress of work at the hospital and medical school made it necessary for him to resign his commission, and from that time until his death he was actively engaged in research and teaching at his school. In 1919 he was elected a Fellow of the Royal Society.

Bainbridge was a man of small stature, and of poor physique and indifferent health. It was always a wonder to his friends how he contrived to get through so much work in the course of the day—teaching, experimenting, writing his books and papers, and examining, a duty which often involved much travelling. Of a quiet, reserved manner, he was nevertheless an excellent conversationalist, and his general interest in men and things outside his immediate work rendered him an entertaining companion. He was constantly struggling against ill health, but managed to carry on by dint of taking long holidays. An enthusiastic researcher, he was modest and self-deprecatory as to the results he had actually achieved. There were, however, few men to equal him as an experimenter, and he never seemed happier than when trying to introduce a cannula into a hardly visible frog's ureter. His was a mind which sought to make order in any jumble of facts with which he was confronted, and it was this power of making the crooked straight which distinguished his researches and at the same time rendered him an excellent teacher and expounder of his subject. He was nothing if not lucid, and the combined grasp of his subject and clarity of expression distinguished alike his teaching by lecture and by the printed page. The small work he wrote with the late Professor Menzies on the *Essentials of Physiology* enjoys an increasing success among all classes of students. In his monograph on the physiology of bodily exercise (1920) he has succeeded in giving a synthesis of a vast material, so that much which before was disconnected and meaningless has been brought into the working fabric of the science of physiology.

It is not necessary to give here a full list of Bainbridge's published work. As with all other scientific workers, many papers represent merely steps on the road to some discovery published in full in a later paper, while others may record excursions along a false track and steps which had to be retraced. But a very large proportion of Bainbridge's work consists of important additions to knowledge which have found a permanent place in the record of scientific discovery. In pathology his most important work was in the differentiation of the different types of paratyphoid bacilli, a study which has been carried very far in later years. It was, however, on the physiological side that his work was of most importance. In his researches on lymph formation, he took up the question of the tissue lymph, and defined for the first time the part played in lymph formation by the metabolism of cells. Working on the submaxillary gland and the liver, he pointed out the defects in the secretory theory and showed that all the results obtained might be explained as due to the production of metabolites in the cells and the consequent rise of osmotic tension in the tissue fluid, which had the effect of attracting fluid from the blood vessels and adding to the lymph flow from the part. The question of the mechanism of urinary secretion was one which occupied him frequently through his scientific career. His earliest work, carried out with Beddard, consisted in a repetition of Nussbaum's experiments, avoiding many of the sources of fallacy which they contained. At first he was inclined to ascribe a secretory function both to glomeruli and to tubules, but later, in experiments carried out at Newcastle, he was led to adopt Cushny's view, in support of which he brought forward many new and ingenious experiments. His work with Evans, on the functions of the mammalian kidney fed with blood from a heart-lung preparation, was, unfortunately, only in the nature of a preliminary communication, but the method promises to be of considerable value for the elucidation of many problems connected with urinary secretion. His work with Dale on the movements and innervation of the gall bladder was a useful contribution to a department of physiology in which knowledge is very deficient. Most interest, however, attaches to his latest investigations on the circulation, and especially to the discovery of the relationship which holds between the pressure on the venous side of the heart and the rate of the heart beat. Many attempts had been made to explain the acceleration of the pulse which occurs in exercise. The "pace-maker" itself is unaffected by the pressure in the auricular cavity, though a quickening of the pulse is one of the methods adopted by the organism for enabling the heart to deal with the greater inflow of blood into this organ which accompanies muscular exercise. Bainbridge showed that any rise of pressure on the venous side of the heart caused a quickening of the beat, partly by inhibition of the vagal tone, partly by reflex excitation of the accelerator mechanism. This condition is the converse of that which is expressed as Marey's law, a rise of pressure on the ventricular side tending to cause reflex slowing of the heart, and it is therefore sometimes described as "Bainbridge's law." The review of the whole subject of the physiology of exercise, which he undertook in writing his monograph on the subject, suggested many new problems for work on the circulation, and he was making plans to attack these problems—partly alone, partly in conjunction with other physiologists—when his work was brought to a sudden and premature close. But he was happy in his work and in the planning of new researches, and he would be content that others should build on the foundations which he has so well laid down.

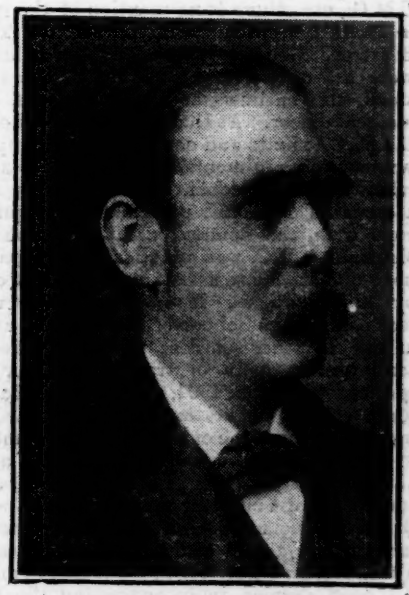
Bainbridge married in 1905 Hilda Winifred, daughter of the Rev. Thornton Smith. In his wife he found a companion keenly interested in his work, who, by her constant co-operation and care, enabled him to utilize his talents to the full, in spite of the disability of ill health from which he so frequently suffered. His wife and a daughter survive him.

E. H. STARLING.

E. O. DALY, M.D., M.R.C.P.,

Consulting Physician, Hull Royal Infirmary.

WE regret to record the death of Dr. Edward Owen Daly, which took place at his residence in Hull on October 18th. He was the elder son of Dr. Owen Daly, consulting physician to the Hull Royal Infirmary, and was educated at Cheltenham, University College Oxford, and St. George's Hospital. He took the diploma of L.S.A. in 1880 and graduated M.A., M.B.Oxon. in 1882, and M.D.Oxon., in 1885; in 1884 he became M.R.C.P. Lond. After having held the posts of house-physician and assistant medical registrar at St. George's Hospital, he was in 1885 elected honorary physician to Hull Royal Infirmary, becoming consulting physician twenty years later. Dr. Daly was for many years a very active member of the British Medical Association. He contributed largely to discussions and wrote many papers in this and other medical journals. In 1890 he was president of the East Yorkshire and North Lincolnshire Branch, of which his father had been president in 1864 and again in 1882. In 1902 he was elected President of the Hull Medical Society. In medical questions his opinion was widely sought, and he took a great interest in public affairs, but being of a retiring disposition took little active part in them. He was greatly respected as a man of the highest character and of sound judgement. A family bereavement some two years ago



(Photograph by Turner and Drinkwater, Hull.)

affected him severely, and latterly his health had been failing. Dr. Daly is survived by his widow, who is a daughter of the late Vice-Admiral von Donop, and by two sons, both of whom have made the army their profession.

J. WICKHAM LEGG, M.D., F.R.C.P., HON. D.LITT.OXON.,
Formerly Assistant Physician, St. Bartholomew's Hospital.

MANY old students of St. Bartholomew's Hospital will have heard with regret of the death of Dr. Wickham Legg, formerly assistant physician to that hospital, whose interest in life is, however, best expressed by the fact, which he placed first in the notice published in *Who's Who*, that he was for ten years chairman of the council of the Henry Bradshaw Society for editing rare liturgical texts. He was born in 1843, retired from the staff of St. Bartholomew's Hospital in 1887, and had resided in Oxford since the death of his wife in 1908. He graduated M.D.Lond. in 1868, and had previously, for a couple of years, been tutor to the late Duke of Albany. He was appointed demonstrator of morbid anatomy at St. Bartholomew's Hospital in 1874, and became lecturer on pathological anatomy and assistant physician to the hospital in 1878. For some years he took an active share in the medical life of London, and in 1883 he delivered the Bradshaw Lecture on cardiac aneurysms before the Royal College of Physicians of London, of which he had become a Fellow in 1876. He published a treatise on haemophilia, and another on bile, jaundice, and bilious disorders. Suddenly, and to those who were not in his confidence rather unexpectedly, he retired from St. Bartholomew's Hospital in 1887, the motive partly being a breakdown in health following a severe attack of rheumatic fever; but a strong reason was no doubt his great interest in the study of liturgical subjects. He was one of the founders of the Henry Bradshaw Society, and edited for it in 1888 the Quignon Missal, and in 1916 the Sarum Missal; in 1914 he published a book on *English Church Life* from 1660 to 1833, and in 1917 an essay on *Church Ornaments and their Civil Antecedents*, as well as a volume of collected essays on liturgical and historical subjects. He leaves one son, who is a Fellow and modern history tutor of New College, Oxford.

THE LATE LIEUT.-COLONEL E. M. WILSON, C.B., C.M.G., D.S.O.—Colonel P. Broome Giles, C.B., writes: In your obituary notice of the late Colonel E. M. Wilson, C.B., C.M.G., etc., there is no mention of the great work he did in connexion with the Volunteer and Territorial Medical Services. Colonel Wilson and his chief, the D.G.A.M.S., were not only sympathetic with, but thoroughly understood, the enthusiasm and difficulties of the Volunteer medical officer. At that time, with the exception of a few R.A.M.C.V. units and certain bearer companies, the system was entirely regimental and opposed to a service. In 1899, when D.D.G., Colonel Wilson speedily realized that the attenuated R.A.M.C. personnel was quite inadequate to cope with the demand created by the Boer war. The Militia R.A.M.C. was practically non-existent, so his only hope of immediate assistance was what could be supplied by the Volunteers. He had frequently visited our Volunteer Ambulance School of Instruction, and so appealed to us and to other sources; we never missed any month to send him a quota of trained men for home or foreign service. Again in 1904, as the technical adviser to Lord Raglan at a deputation of senior medical officers, his intimate knowledge of the value of Volunteers enabled him to present our claim to the D.G.A.M.S., and we had nearly all we asked granted. Lastly, in 1907, as chairman of a committee of Volunteer medical officers nominated by the British Medical Association, his tact, knowledge, and good temper formulated the report which was the basis of Sir Alfred Keogh's Territorial medical scheme. Colonel Wilson did good service in co-ordinating the R.A.M.C. and the R.A.M.C.T. The excellent result the late war proved.

DR. PIERRE HENRI SOULLIER, honorary professor of the Lyons Medical Faculty and corresponding member of the Académie de Médecine, has recently died at the age of 88.

DR. ERNEST DUPRÉ, professor of clinical mental diseases in the Faculty of Medicine of the University of Paris, died recently at Deauville, at the age of 59.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

THE first and second examinations for medical and surgical degrees will begin on Monday, December 12th. Part I of the third examination (surgery and midwifery) will begin on December 13th; Part II (principles and practice of physic, pathology and pharmacology) on December 14th. The M.Ch. examination will be held on December 13th, 16th, and 17th. The certificates of candidates, with their postal addresses, must be sent to the Registrary for Parts I and II of the third M.B., and for the M.Ch. examination by November 12th; certificates for the first and second M.B. by December 2nd.

At a Congregation held on October 28th the following medical degrees were conferred:

M.B., B.CH.—L. W. Jones.
M.B.—L. P. Garrod, H. H. Brown.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.

AN ordinary Comitia of the Royal College of Physicians of London was held on Thursday, October 27th, at 5 p.m., with the President, Sir Norman Moore, Bt., in the chair.

The President announced that Mr. Ronald Henry Knight had been elected the twenty-ninth Jenks Scholar.

Dr. A. J. Cleveland and Dr. F. H. Jacob, elected to the Fellowship at a previous comitia, were admitted as Fellows.

The following gentlemen were admitted as Members:

Jamet Ridell Bell, M.D.Melb., William Harris Best, L.R.C.P., Robert Edward Collins, M.B.Edin., L.R.C.P., Geoffry Challen Linder, M.D.Lond., L.R.C.P., Arthur Griffith Maitland-Jones, M.B.Lond., L.R.C.P., Wathen Ernest Waller, M.B.Oxf., Philip Hewer Wells, L.R.C.P.

Licences were granted to the following seventy-seven candidates who had passed the required examinations:

M. T. Ahmed, S. Annecke, *Helen R. Ashton, T. J. D. Atteridge, *Mary J. Ayrton, A. H. Bean, J. H. Blair, J. G. B. Brass, H. F. Brice-Smith, E. E. L. Burnier, *Linda Catmur, W. E. R. Coad, W. E. Cody, *Nancy M. Coutts, P. G. Cumming, E. C. Curwen, P. T. Davidson, *Edith M. P. Davies, *Muriel A. M. Davies, A. H. Douthwaite, H. S. Drabble, C. T. J. N. Drobig, H. O. Eksteen, A. H. El-Ramli, E. W. Evans, V. Feldman, L. R. Fifield, E. C. H. Foreman, E. Gallop, J. E. Gardner, C. M. Gwillim, C. B. Hawthorne, *Margaret Haywood, *Marjorie B. Hubert, J. W. Hunt, E. R. Jagger, A. V. Johnson, *Eva M. Johnson, D. J. Jones, *D. M. Jones, *Gladys H. E. H. J. Jones, R. O. Jones, E. J. L. Jones Evans, G. Kinneir, F. C. Lewis, W. E. Lloyd, I. B. McCann, *Elisabeth E. McCulloch, A. Maund, E. O. Morrison, J. B. G. Muir, H. W. L. Nichols, F. A. Pickworth, *Enid M. Powell, F. W. M. Pratt, J. A. Prichard, *Philippa P. Pughe, W. G. Roberts, A. T. Rogers, I. Rosenberg, J. J. Rowlands, A. R. Rutnam, *Elaine M. K. Salmond, L. Segal, A. I. Solberg, A. E. Strawbaun, R. O. Swaine, D. R. Thompson, *Helen C. Tompson, *Nellie Vaus, C. E. Whitting, A. B. Whytock, B. W. Williams, W. H. Williams, *Beryl Wiseham, J. R. Wright, *Greta I. Yeoman.

* Under the Medical Act, 1876.

The President nominated Dr. Sidney P. Phillips and Dr. G. F. Still to serve on a committee being constituted by the College of Preceptors in regard to the physical education of girls.

Dr. M. R. Robertson was granted permission to resign his Membership of the College. A letter from Dr. J. J. MacWhirter (Dunbar) asking that the Membership which he resigned in 1881 may now be restored to him was read for a second time.

Professor C. S. Gibson was appointed an Examiner in Chemistry, vice Dr. Le Sueur, deceased.

The President announced the names of the Fellows he had appointed to serve on the Committee appointed to consider changes in the Curriculum and Examination for the Conjoint Diplomas—namely: The President and Registrar (*ex officio*), Sir W. Hale-White, Sir H. D. Rolleston, Sir James Galloway, Dr. H. M. Fletcher, Dr. G. F. Blacker, and Sir John Broadbent.

Sir William Hale-White was re-elected a member of the Committee of Management.

After some formal College business the President dissolved the Comitia.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

AT the annual general meeting of Fellows and Members of the Royal College of Surgeons of England, to be held on Thursday, November 17th, at 3 p.m., the following resolutions will be moved on behalf of the Society of Members of the Royal College of Surgeons of England:

1. That this thirty-fourth annual meeting of Fellows and Members again affirms the desirability of admitting Members to direct representation on the Council of the College, which (as now constituted) only represents those Members who also hold the Fellowship; and that it does so in order that the constitution of the Council of the Royal College of Surgeons of England shall be in keeping with modern ideas of true representation.
2. That as the Royal College of Surgeons is composed of about 18,000 persons, of whom over 16,000 are engaged in general practice, this annual meeting requests the President and Council to nominate *at least* two Members in general practice to represent the interests of general practitioners in the management of College affairs.
3. That this meeting of Fellows and Members earnestly requests the President of the College to make a detailed statement *here and now* as to all the reasons, legal and otherwise, for the Council persisting with a refusal to allow representation on the Council of the Members in general practice; and to state definitely whether legal advice has been taken as to any possible means of overcoming any difficulties in the way of carrying out our wishes: and, if so, to declare what that advice was.

Medical News.

A ROYAL proclamation, dated September 27th, 1921, has formally ordered the disembodiment of the Territorial Force, in pursuance of the Territorial and Reserve Forces Act, 1907.

THE centenary of the birth of Virchow, referred to in an article in our issue of October 8th, was celebrated on October 13th by a congress of medical societies at Berlin.

THE eighteenth congress of the Italian society of oto-rhino-laryngology was held at Ravenna, under the presidency of Professor Biaggi, on October 13th to 15th, when the physiopathology of the nasal cavities was discussed.

THE opening lecture for this winter of the Old Glasgow Club was given, on October 27th, by Sir George T. Beatson, on "An epoch-making event in the history of the Glasgow Royal Infirmary"—the introduction of antiseptic surgery by Lister.

A MEETING of the Medico-Legal Society will be held at 11, Chandos Street, W.1, on Tuesday, November 15th, at 8.30 p.m., when Dr. Thomas Good, of Littlemore Mental Hospital, Oxford, will read a paper on "Nature *versus* Law," with special reference to the development of psychotherapy and its problematical use in the treatment of feeble-minded persons and criminals. The annual dinner will be held on Wednesday, December 14th, instead of Friday, December 16th, as previously announced.

AT the meeting of the Association of Economic Biologists to be held on Friday, November 18th, at 3 p.m., in the Botanical Lecture Theatre of the Imperial College of Science, South Kensington, S.W.7, Dr. E. J. Butler, Director of the Imperial Bureau of Mycology, will open a discussion on "Meteorological conditions and disease."

THE first National Congress of Italian Medical Women was held at Salsomaggiore from October 14th to 16th.

A MEETING of the Central Midwives Board for England and Wales was held on October 13th, Sir Francis Champneys presiding. In reply to a letter from an inspector of midwives it was pointed out that the question of the ownership of a midwife's register of cases is one to be decided by a court of law and not by the Board. An inquiry by a medical officer of health regarding compensation to a midwife suspended from practice in order to prevent the spread of an infection was answered to the effect that if she were suspended by a local authority the question of compensation was one to be decided by the local authority concerned, but if suspended by the Board the question would be decided by the Board.

DR. T. P. STEWART, of Newport, Fife, who has been absent from his practice for some months owing to ill health, has received a complimentary letter bearing the names of 600 friends and patients and accompanied by a silver salver, and a cheque for £1,400, "in inadequate recognition of a long-continued indebtedness."

THE American Public Health Association announces that on the occasion of its fiftieth annual meeting a Health Fortnight will be held, extending from November 8th to 19th. This celebration will include three main divisions: a health institute, from November 8th to 11th; a health exhibition, the largest of its kind ever held in New York, from November 14th to 19th; and the annual meeting of the association, between the same dates. November 13th will be observed as Health Sunday in many churches, and the week will be observed by numerous business and social organizations.

PROFESSOR W. E. DIXON, F.R.S., will read a paper on the Drug Habit at the first evening meeting of the Pharmaceutical Society, 17, Bloomsbury Square, W.C., on Wednesday, November 9th, at 8 p.m.

ON October 20th, at Ladywell Sanatorium, Salford, there was presented to Dr. John W. Mullen, superintendent of the sanatorium, an illuminated address which, in appreciating his long tenure of service, recorded a resolution passed by the health committee of the borough congratulating Dr. Mullen on the completion of forty years' service to the borough of Salford. Since the commencement of his work in Salford upwards of 50,000 cases of infectious disease had passed through Dr. Mullen's hands, and he has himself suffered from almost every infectious disease, including typhus fever, during the course of his duties.

DR. J. SCHOEMAKER, a well-known surgeon at the Hague, has been made an honorary Fellow of the American College of Surgeons.

THE fifth Congress of the German Urological Society was held at Vienna on September 29th, when over 100 papers were read.

THE annual dinner of past and present students of the Royal Dental Hospital of London will be held at the Hotel Victoria on Saturday, November 26th, when Dr. H. Austen will take the chair at 7 p.m.

THE annual autumnal general meeting of the Irish Medical Schools' and Graduates' Association will be held on Thursday, November 17th, at Pagani's Restaurant, Great Portland Street, the President, Major-General Wallace Kenny, C.B., A.M.S., in the chair. It will be followed by a banquet.

THE Aberdeen University Club, London, will hold its sixty-sixth biennial dinner at Gatti's Restaurant, Strand, on Thursday, November 17th, at 7.30 p.m. Graduates of either sex desirous of attending the dinner, or of becoming members of the club, should write to Dr. Milligan, 11, Upper Brook Street, W.1.

IT is announced this week that the well known London firms of Messrs. John Bell and Croyden, Ltd., dispensing chemists, of Wigmore Street, and Messrs. Arnold and Sons, surgical instrument manufacturers, of Giltspur Street, have been amalgamated. The amalgamated firms will in future be known as "John Bell and Croyden, Ltd., incorporating Arnold and Sons."

THE annual dinner of the Chelsea Clinical Society was held in the Café Royal on October 25th. Sixty-five members and guests were present. In proposing the health of the Chelsea Clinical Society, the President of the Medical Society of London (Mr. James Berry, F.R.C.S.) congratulated the Society on attaining its majority that evening, and on the good work done at its meetings. Dr. D. M. Barcroft (President) replied, and later proposed the health of the guests. Replies were given by the President of the West London Medico-Chirurgical Society (Sir Lenthal Cheatle) and the President of the Hunterian Society (Mr. Russell Howard). The President of the Harveian Society (Dr. G. de Bec Turtle) proposed the health of the President of the Chelsea Clinical Society, and Dr. Barcroft responded.

LIEUT.-COLONEL J. H. DUDGEON, V.D., J.P., of Stainburn, near Workington, has been appointed Deputy-Lieutenant for the County of Cumberland.

THE American Ophthalmological Society, the Section of Ophthalmology of the American Medical Association, and the American Academy of Ophthalmology and Oto-Laryngology have arranged to hold an international congress of ophthalmology at Washington from April 25th to 28th, 1922.

THE fifth National Medical Congress of Cuba, which takes place every five years, will be held from December 11th to 17th, under the presidency of Professor J. A. Presno, founder and director of the *Revista de Medicina y Cirugia*, of Havana.

DR. F. G. CROOKSHANK, F.R.C.P., will deliver the Revilliod-Julliard lecture before the Geneva Medical Society on Thursday, November 10th. His subject is: "The Traditions and Development of British Medicine."

THE annual old students' dinner of St. Thomas's Hospital was held on October 28th, at the Wharncliffe Rooms, Hotel Great Central, with Dr. Hector Mackenzie, consulting physician to the hospital, in the chair. The company, which numbered 170, included Sir Anthony Bowlby, P.R.C.S., Sir Robert Hill, Medical Director R.N., Sir George Makins, Sir Wilmot Herringham, Sir Seymour Sharkey, Sir Charles Ballance, and Sir William Macpherson. The Chairman, in proposing "Prosperity to St. Thomas's Hospital and Medical School," gave a brief outline of the history of the institution from its remote origin in mediaeval times up to the opening of the new buildings on the present site fifty years ago by Queen Victoria. The Treasurer, Sir Arthur Stanley, who replied on behalf of the hospital, in his reference to financial difficulties, said that payment by patients was still voluntary at St. Thomas's, though all were urged to pay according to their means. The recent coal strike had been a trying time and had induced the governors to replace coal by oil fuel at half the cost. He mentioned also the participation of St. Thomas's in the national provident scheme, "whereby the 98 per cent. of people who are well pay for the 2 per cent. who are ill." Sir Cuthbert Wallace, the Dean of the Medical School and Director of the Surgical Unit, replied on behalf of the School, and gave a sketch of the year's doings. He said that the number of students was now as large as it had ever been. Discussing new ideas and ideals in medical education, Sir Cuthbert Wallace distinguished between the system which aimed at providing teaching and that which aimed at giving the student an opportunity to learn for himself. The health of the Chairman, proposed by Dr. R. Percy Smith, was received with acclamation, and Dr. Mackenzie briefly replied.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.

2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.

3. MEDICAL SECRETARY, *Mediocra, Westrand, London;* telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361, Central).

QUERIES AND ANSWERS.

INCOME TAX.

"T. McC." sold an Austro-Daimler car in 1920 for £560 and bought a Standard 8.5 for that amount. The full replacement cost of the original car would have been £900.

*** Although the full replacement cost is the measure of the full allowance, the claim for deduction must not exceed the out-of-pocket expense incurred. In this case that expense is *nil*, and no deduction is made. Our correspondent, however, should record the facts for future use. For example, if he at some future time sells the Standard for £200 and buys an A.-D. or similar car for, say, £750, he will be entitled, on the whole of the facts, to an allowance of £550, whereas the maximum (apart from the original car transaction) would have been £560 – £200 = £360.

"DUPLEX," referring to a previous question and answer (October 22nd, p. 677), explains that the tax assessed on the basis of the cash receipts of the firm from which he retired was divided between the continuing partners and himself on the basis of the money received by each.

*** We advise that his super-tax return for the following year should be made on the basis that his income from the practice for the year 1920–21 was one-quarter of his share for the year—that is, his share which terminated outright as at June 30th, 1921. That appears to be the correct apportionment of the income tax assessment, and "Duplex" does not seem to be prejudiced by the fact that he accepted a larger share for income-tax purposes as between himself and his partners.

INCOME TAX: SUPERANNUATION.

"J. J. Mc." inquires as to the proper method of allowing deductions for contributions under the Asylum Officers' Superannuation Act of 1909.

*** These deductions are dealt with as if they were payments in respect of life assurance policies on the contributor's life, and under the Income Tax Act of 1918 the rate of the deduction is limited to 3s. in the £ if the total income is less than £1,000.

FLEAS.

DR. T. G. PARROTT (Aylesbury) writes: In reply to "A. B. S.'s" query in the JOURNAL of October 29th my plan of prevention, which has proved successful, is to fix a small square of camphor in a muslin bag inside each trouser leg about 3 or 4 in. from the lower edge; the bags can be fastened with a safety-pin to the inner seam of the trousers.

LETTERS, NOTES, ETC.

INTRAVENOUS USE OF CALCIUM ACETO-SALICYLATE.

MR. W. HARRISON MARTINDALE, Ph.D., etc., manufacturing chemist (London, W.), writes: In your issue of July 9th last, p. 37, Dr. A. Cambell, medical officer in charge venereal clinic, Royal Portsmouth Hospital, communicated a paper on the intravenous administration of tylcalsin (calcium aceto-salicylate) prepared by my firm. Numerous medical men have since tried the method with somewhat different results. In some cases there has been a lack of toleration and no alleviation of pain; on the other hand, in several cases the reports have been most gratifying—that is, there has been relief of pain, reduction of temperature, and no ill effects. In Dr. Cambell's paper it was suggested that the solution of tylcalsin should be boiled (to sterilize it). It is, however, preferable not to boil the solution; otherwise hydrolysis of the compound will occur. There would be no great risk in preparing the injection using normal saline with the addition of ½ per cent. phenol in the cold. It is true there would remain the chance of infection with the bacteriologist's bugbear, spores, but the chance is negligible, and this chance would remain also after boiling. Experiments to determine whether or no an injection so made under the conditions which would prevail have been conducted, and the solutions have been found sterile. The assumption is that in general they would be so. Tylcalsin in tablet form, unless kept under ideal conditions, is prone to a certain amount of hydrolysis, and it will in future be preferable to supply it in cachets wrapped in tinfoil, or in sealed glass ampoules. In this form the compound will keep unaffected by atmospheric moisture. The substance dissolves quite readily by merely shaking up for a few seconds in a glass bottle. The information I have as to the appropriate dosage indicates that the practitioner should proceed with caution, starting with, say, 0.25 gram initially and gradually increasing the dose, and the injection should naturally be given slowly. (I have a note from one medical man who has given 1.5 grams; this may be regarded as a strong dose and an evidence of toleration.) Dr. Cambell is giving 1 gram doses with uniformly successful results. This letter is written with his approval.

PROFESSIONAL AMENITIES.

MAJOR V. T. CARRUTHERS, R.A.M.C., sends a letter, in the course of which he makes the following observations: The recent references to "surgical dabblers" reported in the JOURNAL may possibly be held as an outsider's excuse for raising his trembling quill to give an impression of the relations between consultants and general practitioners as they appear to one who is neither. It is a great pity that one can seldom attend a meeting where specialists are engaging in discussion with general practitioners without being reminded of Milton's immortal lines:

> Sporting the lion ramped, and in his paw
> Dandled the kid.

To the outsider it appears that medicine would be better served if the specialist either chased the practitioner, roaring, round the floor, so to speak, or else discussed things amicably with him as lion to lion or lamb to lamb. The present common attitude of indulgent superiority is much to be deplored, though it has its comic side. Anybody who takes the trouble to read the controversies of a hundred years ago will agree that medical men have advanced greatly in kindness since then; let us take another step forward, if possible, and allow such words as "dabbler," "bug hunter," "old wife," to follow "butcher," "charlatan," and "criminal" to the pot-house and hustings, where they are welcomed.

SALE OF PRACTICES.

F. P. writes: Although there has been a recent reduction in the capitation fee, one cannot fail to notice that the majority of practices now advertised for sale are offered on the basis of last year's receipts. I wonder, if there had been a further increase in the panel fees, say to 13s. 6d., how it would have reacted upon the vendors? Anyhow, owing to the amount of commercialism in the sale of house property and the premiums asked, comparatively few practices are being sold, as but a limited number of demobilized men are prepared to purchase a house and practice right off, particularly as the lean days are now upon us. At the same time, no one will deny that vendors are entitled to a fair price and reasonable compensation on the sale of their practice.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 41, 44, 45, 46, and 47 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 42, 43, and 44.

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